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Electrical Contracting

*With Which Is Consolidated
Electrical Record*

BOOTLEG wiring is a menace not only to the electrical industry, but to the public as well In this issue the facts are disclosed how to defeat it suggestions from numerous inspection departments what it costs the public how a large and a small city are fighting it and some actual photographs of the bootleggers' handicraft . .

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JEFFERSON ELECTRIC COMPANY
Bellwood (Suburb of Chicago) Illinois

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FUSES**

VOLUME 32
NUMBER 10

electrical contracting

WITH WHICH IS CONSOLIDATED ELECTRICAL RECORD

S. B. WILLIAMS, EDITOR AND GENERAL MANAGER

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Orders Come
To You?



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Division of

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A New Deal Salesman

UNDER competitive selling with price as the clinching argument it did not take a very high calibre salesman to peddle a manufacturer's wares. He had to be able to meet the trade and be well-liked so that prices being equal he would get the business.

How far will that kind of selling get when the N.I.R.A. program gets under way?

BY putting the lid on the chiseler N.I.R.A. is making a new deal in selling. Competition in the future will not be on price but on the quality of the product, its performance, its value to the user. To be able to sell a product in that manner instead of on price requires salesmen who know their product and its relation to the requirements of users.

It has not been necessary in the past for a salesman of a standardized product to thoroughly know his line. Many lines were handled by manufacturers' agents who merely had a customer following.

This has led to the common expression "What's the difference? It's Code wire, isn't it?" The same thing could have been said about any other of the regular bread-and-butter items such as boxes, or conduit or armored cable.

As a matter of fact, it is this attitude that has robbed the wholesaler of sales enthusiasm for bread-and-butter items. It is this attitude that has so frequently wedded contractors to salesmen rather than to lines.

This new N.I.R.A. type salesman should change this picture. He should bring to

bread-and-butter items some of the same selling enthusiasm that we now have with specialties. If he can see something in a switch-box to sell a wholesaler, the latter will see something in that box to sell a contractor.

This type of salesman will undoubtedly improve the selling efforts of the wholesaler which, in turn, will be reflected in the selling of the contractor.

IT will be necessary, however, to back this salesman up with more and better promotional material. His competition will come from other equally keen men and to keep his product sold in between calls, to keep his distributors firm, will need good sound continuous advertising.

This type of salesman will probably command a greater income but his travel and entertainment expense will probably be lower.

What he receives in larger income will be more than made up in what he saves in sales at firm prices.

The new deal offers many interesting economic problems, not the least of which is that pertaining to sales.

It should bring to the electrical contractor market development for electricity as a whole, market development for individual products, improved selling technique, an opportunity to take over markets now being sold by wholesalers and manufacturers at a loss.

Under his own Code selling will not be permitted below cost so that he too will be able to see new selling opportunities.



**Motor Starting Switches
with HAND LEVERS and FUSES
are relics of the "hand crank" era!**



Splash-proof cabinets are available for breweries, dairies, and other moist applications.



Sell More Industrial Wiring Jobs by Featuring This New Type of Hand-Operated Starter!

The Bulletin 609 is an amazing improvement over the old so-called "safety switch" starters.

Sell the idea of replacing the antiquated "hand lever" starting switches with these low-cost 609's. Two convenient buttons—START and STOP—work the quick-acting mechanism as easily as a snap switch.

There are no fuses to blow—nothing to replace or tamper with! Any operator can reset the over-load breakers. No delay or danger.

If your jobber cannot supply you, consult nearest Allen-Bradley Sales Office, shown below.

Almost any power installation can use 609's. They require less room than knife switches, they are easier to wire, and each 609 sale means more money to you. Build up a reputation for high grade industrial wiring by recommending this modern hand-operated switch and get a bigger share of the industrial work in your community. Send for Bulletin 609.

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Switch mechanism showing double break silver-to-silver contacts and overload breakers.

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electrical contracting

WITH WHICH IS CONSOLIDATED ELECTRICAL RECORD

AUGUST
1933

hammurabi's Law BY JOHN WISE

Away back 4000 years ago, Babylon started to grow by leaps and bounds under a smart King named Hammurabi. Through his wise yet simple rule business and the population pyramided so fast that the Empire was soon enjoying the greatest building boom in Ancient History.

Thousands of structures springing up like mushrooms over night sounds like the millennium to us. However, like most booms, this one had a catch in it—it got too fast and top-heavy. Careless, slam-bang construction caused by the rush brought on disaster. A man would move into his new home, all proud and happy. Then he would forget himself and kick the cat or drop his watch, and the next thing they would be digging his body from the ruins and saying he was a good guy when he had it.

After a few months, with the surgeons rich enough to play the market and the undertakers all driving Packards, the growing casualty list got Hammurabi's goat and he called in his Grand Vizier. "You get around a lot, Viz," sezze, "What's the cause of all these here domiciles folding up like a tired mule and ruining my subjects?"

"It's the bootleg builders, Your Majesty," replied the Vizier. "The what?" yelled the King. "It's the truth,

Ham, I wouldn't kid you," insisted his Right Bower. "Every sun-of-a-gun and his Cousin Hugo that can hit a nail are crashing the game, and what they put up, the rats won't live in. And on top of the danger angle, the price-cutting is ruining the industry—real builders are not making a dime."

"I'll fix that!" growls Hammurabi. "Write this law, and tell Congress I want it passed before the six o'clock whistle blows: 'If any builder build a house for a man

and do not make construction firm, and the house which he has built collapse and cause the death of the owner of the house, that builder shall suffer death.'"

You guessed it, fellows. Thousands of fly-by-night jerry builders were automatically eliminated, and those remaining hastened to use such good material and workmanship that those houses are be-



ing found today by excavators.

Our industry faces a similar situation in bootleg wiring, and you all know what that is. Most of it is done by persons who are not competent. For this reason, and because in practically every case bootleg wiring is uninspected, it is work that is below standard and priced below the market. This means it is work taken away from legitimate contractors who charge legitimate prices.

Equally guilty are contractors who have not taken out a license, and licensed contractors who neglect to secure a permit; all are fostering an unhealthy condition. And, in spite of the saying that you can't make a man behave by legislation, I claim the cure lies in the legal power and machinery given to every community, large or small, by the Constitution.

Hail Hammurabi!

Cooperation between organized contractors and inspectors will **Curb Bootlegging**

A STRONG organization of contractors working in close cooperation with the local inspection department is probably the best way to curtail wiring bootlegging activities.

This was divulged in the answers to a series of questions sent both to local inspectors and to local associations of electrical contractors.

In cities where the best results were reported it was almost invariably stated that this was due to that kind of organized cooperation.

It was also apparent, however, that this kind of cooperation could be effective only when the city had an ordinance that provided for punishment of those doing wiring without a permit, and furthermore it was necessary to have an energetic inspector who would follow complaints promptly.

On the Increase

It was obvious from the replies to the questionnaires that the bootlegging of wiring is decidedly on the increase and in some cities has assumed alarming proportions, even to 50 per cent or more of the wiring. While a number of cities reported that bootlegging was of little or no consequence; a very large percentage did report that wiring of this character was accounting for from 10 to 50 per cent of the local wiring activity.

With few exceptions the work is confined almost entirely to old buildings. It is apparent that ordinances are such as to almost entirely prevent bootlegging of new work.

While in a great many instances inspectors reported that the bootleg work was being done by owners, janitors, out-of-work electricians, factory hands, etc., it was not possible to escape the fact that in many cities inspectors reported the contractors as being the worst offenders. In those cities contractors were neglecting to take out permits to save the

fee. In such cases, of course, the work was not inspected unless it was brought to the attention of the department by somebody else.

The illegal work is done, for the most part, with approved material. The results of the survey show that in all probability less than 25 per cent of the work is done with unapproved material. In some cases, however, material, while approved, was not approved for the work for which it was done. On the other hand, the fact that such a large percentage as 25 per cent is done with unapproved materials is in itself serious.

Unapproved Workmanship

In almost every instance, however, the reports went on to say that while the materials might, for the most part, be approved, the work generally was not done in an approved manner.

It is interesting to note where these bootleggers of wiring, other than contractors, secured their material. National mail-order chains seemed to head the list, closely followed by five-and-ten cent stores and hardware stores. In many reports it was stated that electrical wholesalers were not only prone to sell this kind of buyer over-the-counter, but in some instances went out to solicit that type of business. In one large middle-western city it was stated that bootleggers could buy over-the-counter from at least four out of the six recognized local wholesalers without showing a license.

Difficulties

There have been many difficulties in the way of the inspectors. Many departments have been curtailed with the result that the present force is not adequate to the job. Again local politics have played a big part in many cities in preventing the serious application of local ordinances. The ordinances, some of them, have been

so drawn as to make it virtually impossible for an inspector to secure a conviction. The depression has softened the hearts of the judges, and in far too many cases the offenders have been let off with a suspended sentence or a reprimand. In some cities the rules of evidence of the courts are such as to make it almost impossible to secure a conviction. In one city, for instance, at least two people must see the offender actually at work in an illegal manner.

On the other hand, in cities where the ordinances have been properly drawn and where the inspectors are on their toes, convictions have been secured and have been very salutary. Out of 77 replies from inspectors, 43 had taken cases into court and met with some success. Of these 36 had been able to secure judgment against the offender.

Inspectors' Plans

For the most part, the inspectors have been trying to minimize bootlegging. Less than 25 percent reported that they had made no effort in this connection. It is true that many of those who have tried have not tried very hard and have not worked on anything definite. On the other hand, it was encouraging to find that more than 50 percent of the inspectors had some definite plans.

These plans fell into the following groups: To secure active cooperation of contractors; reinspection; advertising and publicity to the public; campaign for better licensing and wiring ordinances.

A number of inspectors suggested that the only way to control this activity was through rigid state licensing that went into every town and hamlet.

Association Efforts

The contractors, through their associations, on the other hand, have been far less active in fighting this raid on their business. While more than half of the associations that re-

ported have something definite under way, it is known that most of the associations that did not report have no activities of any kind under way.

However, with one exception, associations that are working on this problem are meeting with success. The successful activities on the part of these associations are almost entirely that of backing up the inspector by furnishing him, either directly or through the secretary of the association, information that shows where bootlegging is going on or has gone on. Some associations furnish members with cards on which they can give all of the necessary information. It is not necessary that these cards be signed. One association, since the first of the year, has been furnishing its inspection department with information on approximately 75 jobs per month.

Suggestions

In addition to cooperation between the local contractors and the inspection department, there are numerous other activities that were suggested as ways in which bootlegging could be controlled and minimized. They are: Reinspection of all buildings; reinspection of all vacated premises before current can be turned on; local publicity; ordinances that can be enforced; more inspectors; cooperation of utilities and wholesalers; sales control licenses; state licenses.

One inspector has built an exhibit which he takes to meetings of local social, fraternal and business groups.

In the matter of local publicity the inspectors, many of them, appear to need help and guidance. They need to know the type of material that the newspapers will accept and they need to know that only by a continued campaign will progress be made.

It would appear from this survey that with return of business much of this bootlegging would disappear and conditions would be a little less serious. On the other hand, this breakdown of our local ordinances has done considerable, it would appear, to strengthen the relationship between inspectors and contractors and to promote the cause of reinspection.

It should not appear from this that the problem is no longer serious because it is. The result of the survey indicates quite definitely that there is a problem for electrical contracting associations, a problem which can be solved through team-work.

Suggestions from Various Inspection Departments as to Best Kind of Program to Set-up Locally to Reduce the Bootlegging of wiring to a minimum

Kenosha Wisc.: By means of demonstrations continually show the public the disastrous results and the hazards from not using proper materials and workmanship.

Salina, Kans.: Educate the public through a series of articles in local newspapers.

San Francisco, Calif.: Appeal to the electrical industry to notify inspection departments of installations made without permits, and furnish all members of industry with cards to be filled out and sent to department.

Syracuse, N. Y.: Systematic reinspection; closer cooperation between inspection department and contractors in reporting violations, and closer cooperation between contractors and jobbers in the matter of credits and trade discounts.

Gary, Ind.: Sell the idea of safe wiring to all city officials.

Pampa, Texas: Report to city inspector all wiring installations being made, and get the consent of city officials to prevent work on any building until the work is given to a licensed electrician.

Fort Wayne, Ind.: Education of electrical contractors to do work of highest standard.

Portland, Ore.: Organize contractors strongly to work with inspection department.

Santa Paula, Calif.: Secure agreement with utility not to hook-up any installation that is not up to standard and does not have the inspector's card of clearance.

Watertown, N. Y.: Secure a state license which could be enforced by inspection service having jurisdiction.

Toledo, Ohio: Publicity on unsafe conditions.

Riverside, Calif.: A series of educational articles in local newspapers.

Newark, N. J.: Appeal to the pride and safety of the home-owner and tenant to have the highest standard of electrical work in the residence, as well as educate the merchant and manufacturer using illegal material and methods.

Fort Worth, Texas: A better wiring campaign by local electric league; advertising in daily newspapers on hazardous conditions, using photographs; reinspection campaign by insurance and electrical inspection departments; proper educational campaign among legitimate electrical contractors and proper cooperation of all branches of the industry.

Fargo, N. D.: Control of sales of material to only licensed and bonded men who can show a city permit.

Pomona, Calif.: Prevent the sale of sub-standard materials.

Charlottesville, Va.: Educate the pub-

lic to realize what the inspection department means to them and explain that proper installation is a safeguard to everyone against injury to life and property.

St. Louis, Mo.: Educate the public through newspapers.

Charleston, W. Va.: Have a well-organized group of electrical contractors to cooperate with enforcement agencies.

Mobile, Ala.: Have each electrical contractor report bootleggers.

Ithaca, N. Y.: Support inspection department by having licensed contractors report all of their work for inspection and also report all illegal work coming to their attention.

New Haven, Conn.: Reinspection.

Lynchburg, Va.: Newspaper articles.

Detroit, Mich.: Reinspection.

Jamestown, N. Y.: State license.

Baltimore, Md.: License the supply house against selling material to non-licensed contractors.

San Jose, Calif.: Reinspection supported by city officials.

Waco, Texas: Reinspection.

Santa Cruz, Calif.: Convict the bootlegger in court and notify the public through newspaper publicity.

Oxnard, Calif.: Publicity on the danger of fire hazards.

Roanoke, Va.: Heavy penalties.

Little Rock, Ark.: Prohibit the sale of wiring material to people other than licensed contractors.

Durham, N. C.: Uniform inspection practice or Code enforcement throughout the state; cooperation of all electrical contractors within the state with inspectors, and education of the public as to the necessity for inspection of all work installed.

Springfield, Ill.: A state licensing law, which law must be as binding in the rural districts as in the village and cities.

Kokomo, Ind.: Educate the public as to the value of proper wiring.

Pensacola, Fla.: Cooperation of licensed electrical contractors and their employees and also the utility.

Miami Beach, Fla.: Close cooperation between inspectors, electrical contractors and the utility.

Omaha, Nebr.: Penalize all bootleg work.

Davenport, Iowa: Close the electrical departments of chain stores and prevent the sale of wiring materials and lighting fixtures by these stores.

Salt Lake City, Utah: Publicize the convictions of offenders.

Burbank, Calif.: Reinspection.

Holyoke Fights Bootlegging with Reinspection

MOST of the unauthorized, or bootleg wiring in Holyoke, Mass., according to Paul O. Neumann, assistant inspector of electric wiring, is installed by owners, lessees, or tenants and consists mainly of cord wiring.

Recently some work was discovered to have been done by an unknown person who had been soliciting wiring work. The inspection department at once called in the reporters of the three locally circulated newspapers and through them advised the public that wiring work should be given only to licensed contractors.

"Persons installing electrical equipment," the statement read, "wiring or fixtures or any addition, alteration or extension to existing installations, including oil burners, refrigerators, or receptacles for radio must first obtain a permit from the wiring department. When employing an electrician other than an established local electrical contractor ask to see the permit before advancing money for materials and require a certificate of approval from the inspector before making final payment."

The newspaper items further went on to say that much of the work done by unauthorized people had come to the attention of the inspection department and had to be condemned as defective and dangerous. This work, it was stated, came to the attention of the department as the

result of reinspection then being conducted because of a recommendation of the National Board of Fire Underwriters which had just completed a survey of the city.

In this fashion has Holyoke been able to use reinspection to reduce bootlegging.

The reinspection started February 24 and was confined entirely to vacated commercial properties and properties where a change in occupancy was being made. In the first three months forty-three such inspections were made. Only those properties were listed where no immediate alteration of the wiring was being planned.

Of the forty-three listed,

23 were certified at once,

18 were corrected after being certified, and

2 made entire new wiring installations.

Properties could not receive service so long as they were listed and not certified.

The form (reproduced on this

page) used for reinspection is that developed by the New England Insurance Exchange. It lists fifty-six things for the inspector to look for.

For each property a form is filled out and the defects are checked. This gives a complete record of each occupancy in the simplest manner and with the minimum amount of reporting by the inspector.

These forms are turned over to a stenographer who uses a form letter to notify both tenant and owner of the defects found.

The most frequent defects found have been checked on the form by Mr. Neumann. They are improper fusing, improper support or insulation of wires, wires not in use still connected to circuits, faulty joints, cord wiring, wrong cords for portables, improperly bushed sockets.

The success Holyoke has had with this program leads Mr. Neumann to state that he believes this to be the best known program to set up locally to reduce bootlegging of wiring to the minimum.

Electrical Contracting, August, 1933

NEW ENGLAND INSURANCE EXCHANGE

New England Insurance Exchange.

Form No. 1

Place..... Date.....

Street.....

Owner.....

Tenant.....

Occupancy.....

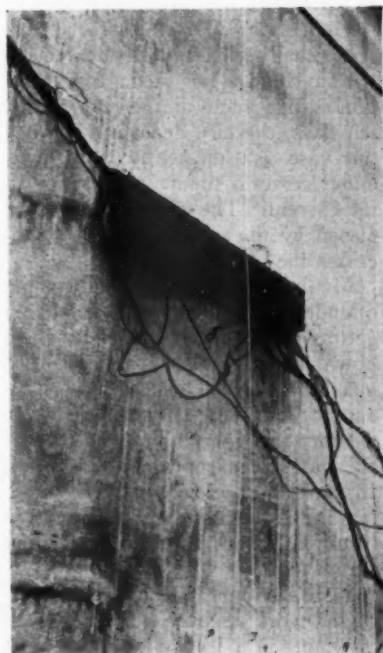
Neatly.....

- 1 Service Wires should have approved insulation, be supported on porcelain insulators, and clear building through approved openings.
- 2 Service Wires should be protected against contact with everything other than their designed supports.
- 3a Service Ducts should be sealed.
- 3b Service Wires not in use should be removed.
- 4 Main Cutover, installed in an approved cabinet, should be placed on service wires just inside building.
- 5 Cutover and Service should be in a readily accessible place.
- 6 Cutovers should be of an approved plug or cartridge type.
- 7 Cutover should be placed where a change is made in the size of wire.
- 8 Cutovers should be divided so that not more than 12 wires will be dependent upon one cutover.
- 9 Cutovers should be properly fused.
- 10 Approved Fuse Boxes for 250 volt work should be provided for cutovers.
- 11 Each Arc Lamp, Metal, Metal, or Electric..... should be protected by a properly fused cut-out.
- 12a Meters..... should be kept clean.
- 12b Worn-out meters, rotaries, switches, chutes, etc., should be replaced by approved fittings.
- 13 Cutovers, switches, rotaries..... should be properly supported.
- 14 Wires on Composite Cutover Cabinets should be fused throughout with 3/4" rigid aluminum board or other approved material.
- 14a Doors to Cabinets should be kept closed.
- 15 One Light only should be run from a rotary.
- 16 Main Service, installed in an approved grounded metal cabinet, should be placed at entrance of service wires.
- 17 Main Service should be of an externally operable indicator type.
- 18 Knife Switches, receptacles, rotaries, and sockets should be of an approved type.
- 19 Soap Switches and Receptacles on open work should have porcelain sub-bases.
- 20 Fuses Switches and Receptacles should be of approved make and be enclosed in approved boxes.
- 21 Wires run in raceways, in conduit, concealed, should have approved rubber insulation.
- 22 Wires and/or Uninsulated insulated wires should be replaced with wire having an approved "sheathing" or rubber insulation.
- 23 Wire joints in raceways are not approved. Approved fittings should be used for taps.
- 24 Wires run on side walls should be protected from mechanical injury.
- 25 Wires run across timbers or joists should be run on hickboards or protected by guard strips.
- 26 Bare Places in wire or cords should be taped.
- 27 Wires should be properly supported, pulled taut, and thoroughly insulated from building, pipes, etc.
- 28 Wires..... should have approved rubber insulation, be supported on approved hickboards, and all lights should have waterproof sockets and construction.
- 29 Wires should have the required separation distance.
- 30 Ladders and Power Wires in elevator wells, theaters and garages should be run in approved conduit or armored cable.
- 31 Wires should be kept clear of piping back of insulating joints.
- 32a Wires not in use should be disconnected from circuits and removed.
- 32b Insulation Service of wiring should be used.
- 32c Joints in wires should be well made, and properly insulated and taped.
- 33a Stranded Wires, except on flexible cords, should be twisted together before being tinned under change or covers.
- 33b Armature Wires should be provided where wires pass through walls, partitions, floors, lattice ceilings or cabinets.
- 34 Metal Outlet Boxes on Plates to be installed at all outlets, and a lock and take work the flexible tubing shall extend from the last hand into and be secured to each house or place.
- 35 Flexible Tubing, continuous from last previous support to end, should be used where wires are fitted.
- 36 Cases Over Time should be firmly secured in place.
- 37 Flexible Cases should have approved insulation.
- 38 Flexible Cases run on ceiling, side walls, or through partitions, should be replaced by supports wires properly installed.
- 39 Metal, Aluminum Cases on Partitions should be used in these places and doors closed.
- 40 Flexible Cases should be shortened and hung free.
- 41 Special Cable Cases should be provided for partitions.
- 42 Worn-out Raceways should be thoroughly fixed.
- 43 Raceways should not be used in damp places.
- 44 Defective..... Cans, Sockets, Switches, Rotaries, and Receptacles should be replaced by new and approved.
- 45 All Sockets should have approved insulation.
- 46 Composite Gas and Electric Partitions should be insulated from their supports by approved insulating joints.
- 47 Partitions which are ungrounded should be insulated from metal work of ceilings or side walls.
- 48 Rotaries should be mounted on stop or made hane.
- 49 Cutover, Aluminum Cases on Metal Raceways should be properly bonded and grounded.
- 50 Power Control Partitions should be used on conduct, grounded cable and recovery. Bushings alone are not sufficient.
- 51a Cases should be replaced on all conduct fittings.
- 51b Cutover on Aluminum Cases should be continuous from outlet to outlet or junction box.
- 52a Cutover on Aluminum Cases should be secured in an approved manner.
- 52b Composite, Pipe and Partitions should be replaced by approved conduct.
- 53 Flexible Ladders should be protected by approved wire guards.
- 54a Portable Ladders in garages should be equipped with approved safety sockets of the standard composition or metal-sheathed portable type, the socket being provided with handle, lock and substantial guard.
- 54b Cases Over Time of glass or porcelain are needed in places.
- 55a Cases should be provided for recovery lines.
- 55b Cases and Wires should be properly connected to circuits.
- 56 Cutovers and Switches should be enclosed in approved..... cabinets.
- 57 Wires in a generally poor condition.

Inspected.....

What Price Bootleg Wiring?

To do a first-class signal wiring job in an old north side Chicago residential hotel, a contractor made a bid of \$200. This was turned down and the work given to a handy man who quoted \$125. The facts and the final cost tell the story of the owner's grief.



"Panelboard" in Building Court
for Bootleg Signal Job.

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The Facts

The man who did the original bootleg wiring used armature and field winding wire to cut costs of this job. Calcimining caused frequent shorts due to the thin covering on this winding wire.

The bootleg electrician ran wires along the top of stair panels instead of drilling through the ceilings. Wire was looped over nails.

Buzzers sounded in rooms when no calls were sent from the office. Likewise guests failed to receive calls.

Formerly all buzzers were the same and people often answered calls to the adjoining rooms by mistake. Now buzzers of different tone are used to correct this error.

From this experience the owner had learned the advantage of having work done by an experienced and responsible contractor and now has a life-time installation. The contractor has sold the owner on the use of good material because it is easier to install and in the long run saves money for the owner.

The owner has learned that he usually gets stuck when a job is accepted at less than the cost of a quality installation.

The Cost

Legitimate contractor's original bid for a first-class job\$200.00

The bootlegger's price.....\$125.00

Upkeep cost during two years of service, grounds, shorts, etc. 250.00

Cost of rewiring two years after installation of this bootleg work 125.00

One tenant moved out because he failed to receive calls ?

Poor wiring as a contributing factor to check-outs.. ?

Total cost (intangible loss not estimated)\$500.00

Original estimate of legitimate work 200.00

Cost to owner of bootleg work\$300.00

New York Contractors Cooperate to War on Bootleggers

By Leslie H. Allen

"UNLICENSED Electrician Fined \$10," "Unlicensed Electrician Jailed"—such newspaper headlines herald the progress of the war being waged by the Council of Electrical Contractor Associations of Greater New York on bootleg wiring.

Members of the dozen associations comprising the Council have reported more than one hundred cases of bootleg wiring done by unlicensed men. Violations have been placed on eighty jobs by both the city and underwriters' inspectors. Six unlicensed men have been brought into court. One was fined \$25 for a second offense, one was fined \$10, one got two days in jail (he refused to pay \$5 fine), one case was postponed, and two men are under suspended sentences with promise of jail if they repeat their offenses.

But the surface of the bootleg wiring mess in New York has been merely scratched. The assistant manager of the union told me that "if all the rotten wiring in this town were corrected, every electrician in the city would be continuously employed for five years."

Since January 1, city inspectors have placed 2,000 violations. How many were committed by unlicensed men nobody knows, but it must have been plenty. Most of the emergency calls to the utilities are caused by work never inspected. Naturally, unlicensed men do not report their jobs for inspection.

Of the \$225,692 fire loss from electrical causes in 1932 a total of \$212,168 was directly chargeable to improper maintenance or alterations and extensions made without the knowledge or approval of the inspection departments. Only \$13,525 loss was recorded on equipments that had been inspected and found in satisfactory condition at the time of inspection.

Organized war on bootleg wiring began last Fall when the Independent Electrical Contractors Association started to check hazardous conditions

and jobs by unlicensed men and report them to the authorities. The intention was to clarify the licensing situation and to get the city electrical code enforced as written. At the outset cooperation from the underwriters was more apparent than from the city department, which could not show partiality to the Independents.

Hence the Independents moved toward aligning all contractors' associations along the battlefield. On April 8 the Council was formed, consisting of two representatives of each of the dozen associations, headed by a chairman, A. Lincoln Bush, four vice-chairmen, a secretary and a treasurer.

The Council's chief purpose is to insist that all electrical work be done by legally authorized persons and installed in accordance with the city electrical code, impartially inspected by all departments having jurisdiction.

Ammunition to achieve that purpose is gathered through a card system. Each of the cards distributed among association members bears a serial number. The printed form enables the member to check work installed by unlicensed men, or installed improperly, also house number, street or avenue, floor, type of business, name of occupant, description of job.

The member dates but does not sign the card and mails it in a prepaid return envelope to George W. Neil, Council secretary. He has a record

of card numbers showing which members hold them. When a filled-in card comes back he makes his own record of the facts and the member sending it. Then he transfers the information to two three-by-five cards, sending one to the City Department of Water Supply, Gas and Electricity, and one to the New York Board of Fire Underwriters.

In special or emergency cases Neil himself investigates first. Because the underwriters are interested only in violations from the fire hazard standpoint, cases of unlicensed men are reported to the city department first. They immediately send out an inspector to catch the unlicensed man at work. This is the best evidence for a possible court case; because in such cases the judge invariably asks, "Did you actually see this man at work on the job?"

Both departments follow through. If warranted, a violation is placed on the job, giving 30 days for correction. After that period an order to remedy within 10 days is issued. If correction is not made at the end of this ten days, the city department, when the case is sufficiently hazardous, either serves a summons or shuts off the current. The effect of violations placed by the underwriters is to increase the insurance rate.

Manhattan district is not bringing offenders to court to any extent, but getting after owners to show them how expensive it is to have unlicensed men do the work. The increased insurance argument is used, as well as the fact that correction of all or part of a job means paying for it twice. Injury to the pocketbook of the owner may be as effective an argument as threat of court for the unlicensed man.

Here's a typical example of unlicensed work uncovered by the Council scouts in a seven-story apartment building:

Conduit not securely fastened and does not terminate in approved fit-

0 Date: _____

This is to inform you of violation of the Electrical Code as follows:

Work installed by unlicensed men ☐ check

Work installed improperly ☐ check

House Number _____ Street or Avenue _____ Floor _____

Type of Business _____ Name of Occupant _____

Describe briefly _____

Card on which members report to the council unlicensed men and work improperly done.

tings; flexible cords, deteriorated and spliced, used as circuit wiring; joints neither properly soldered nor properly insulated; outlet boxes missing; fuses too large; cutouts not enclosed in approved metal cabinets; defective sockets; fixtures not properly fastened; sockets with 1/8-in. hard rubber threaded bushings not approved; receptacles not approved; porcelain receptacles not approved where subject to mechanical injury; cord pendants should be suspended from approved fittings to take strain from joints; cutouts bridged with copper or other unapproved materials; wires joined under binding screws of cutouts and other devices and not spliced or soldered; all fittings not properly fastened in place.

That job had been developing for for a long time. As the result of the Council's work, both the city department and the underwriters went after it. Correction is now under way at a cost perhaps triple that of a proper original installation.

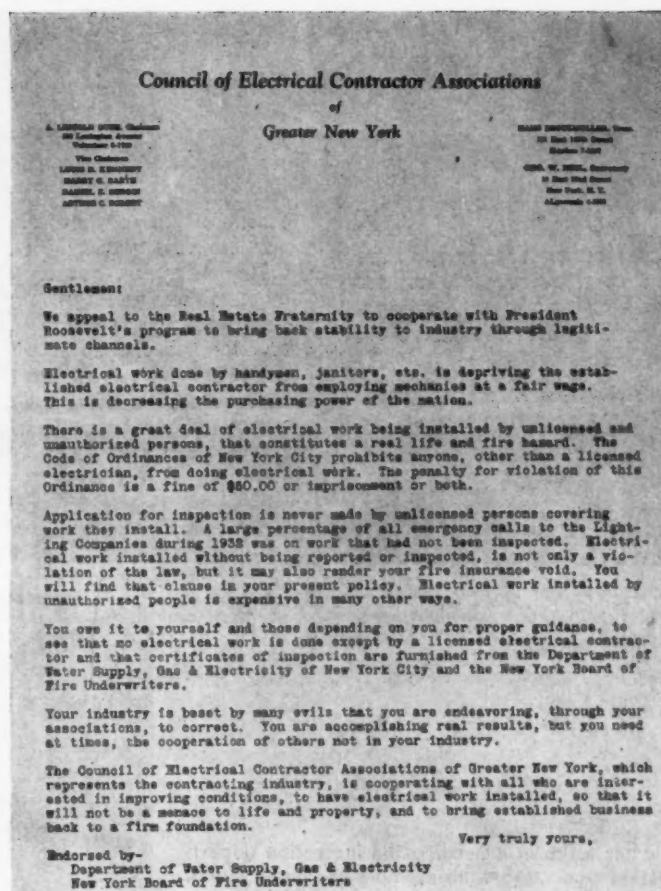
The Council also uncovered a handy-man's handiwork in a 40-family apartment house the correction of which will cost upwards of \$1,000. An association member found another handyman working in a building divided into two-room apartments, using old cable, old cutout boxes, cutouts not enclosed, etc. Both departments placed violations on the whole building. Thorough correction would mean tearing out the entire job and doing it right from the start.

Outlets above a certain show window were found wired with silk cord. Correction cost only about \$50, but the main object in all these cases is to get the unlicensed man out of the picture.

In a loft and office building lamp cord was used throughout for circuit wiring, circuits were overloaded, and the entire equipment was in a hazardous condition. Both departments placed violations and correction was made by a licensed man at a cost of about \$200.

One of the ingredients of the New York bootleg mess is that men can get licenses who do not seem actually entitled to them. Several hundred members of the union, who are supposed to be electrical workers and not contractors, have licenses. And as this is written two members of the union are on the carpet for obtaining contracts to do electrical contracting work on government jobs.

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Letter to real estate fraternity asking for cooperation against uninspected work. Note endorsement of both inspection departments.

The Council has compiled a list of all master electrician license holders in Greater New York—about 4,500. Every one is being investigated to see if he complies with the law in accordance with an interpretation obtained by the Council from Commissioner John J. Dietz, as to the requirements for obtaining and holding a license.

The Council estimates that about 50 per cent of electrical work in Greater New York is done by unlicensed men. The biggest job, then, is to clean up that situation and after that to see that legitimate holders of licenses do jobs according to the city code as written.

Newspaper publicity is being used to good effect. Written appeals for co-operation from city magistrates, corporation counsel, state labor department workmen's compensation division, newspapers, real estate interests, etc., have aroused gratifying responses.

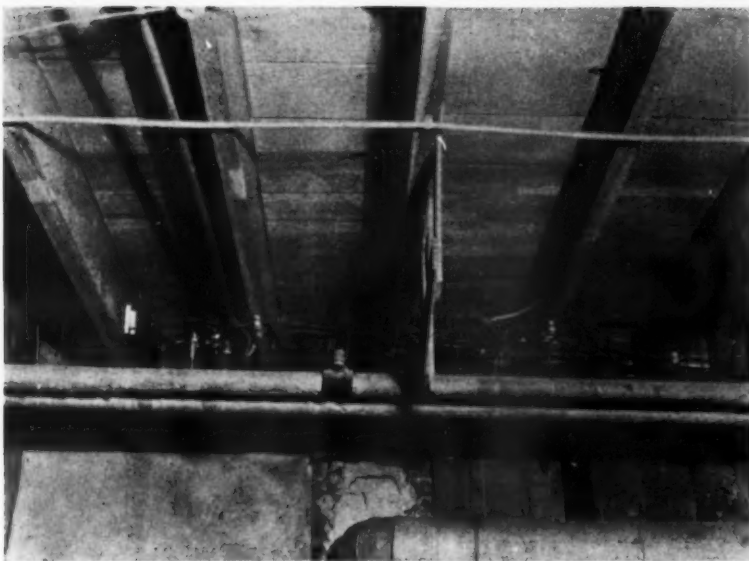
The Council obtained approval

from the city department and the underwriters for publication of its letter to the real estate fraternity stressing the necessity for having work done by licensed men and then properly inspected.

The Gibson unemployment relief committee was prevailed upon to stop doing electrical work in competition with contractors. That committee had a complete construction department but does not have it now.

In cooperation with the city department and the underwriters the Council is working toward regular periodic inspection of all buildings with the date of last inspection posted in each building.

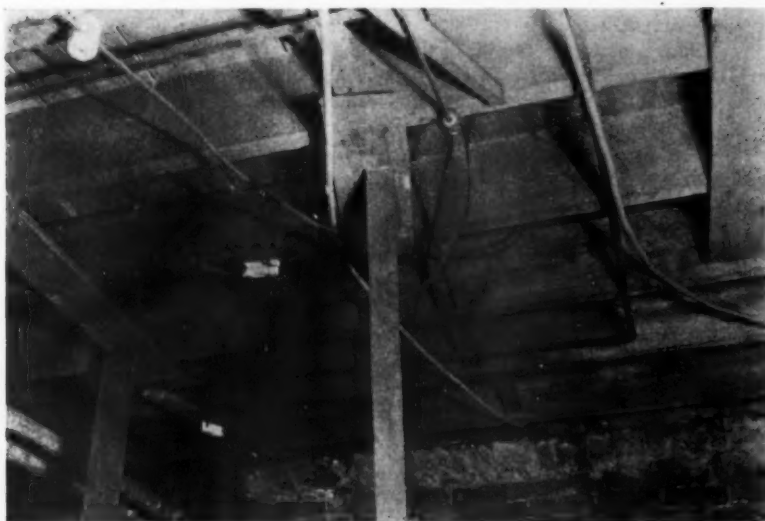
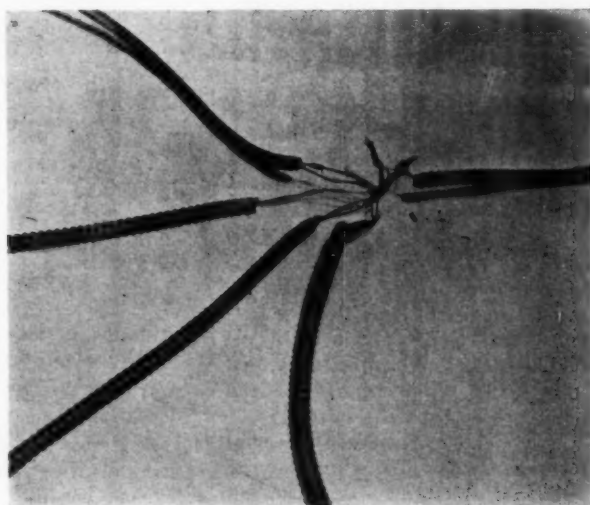
Thus upon the field of battle against unlicensed men and bootleg wiring the dozen contractors' associations in Greater New York have been coordinated. A common danger and a common constructive cause has brought about that unity which otherwise might have been impossible.



Some Samples of the

A fine mess of hazardous wiring over pipe lines in a corner of a cellar. Armored cable can be seen tapped on without proper fittings.

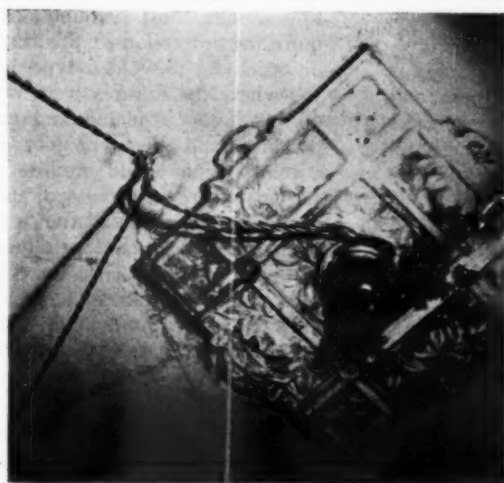
After a fire in a building the inspection department came across this example of shyster wiring. These five cables were spliced together just as shown under the flooring with no box, or even the use of solder or rubber tape. They were cut off and laid on a table and photographed as shown, as conditions made it impossible to get a picture in its original position. The insulation has been completely consumed by the fire either of its own making or by the path of the flames.



The circuit wires first seen in the upper left-hand corner consist of twin No. 14 wires supported on single knobs. When a tap is required it is done as seen in the cleat line. Twin wires disappear up through floor as also does P. S. cord which is tapped off just in back of stud. Ground wire to the right is not properly protected and supported. Armored cable line is tight against joints.

s of Handiwork Handy-man

A job of wiring a light on the cellar stairs. Note lack of tubes through timber, two wires on one knob and as this is a low narrow stairway the open wires are subject to mechanical injury.



A common bootleg method for securing surface extension

A corner containing some very handy-man wiring. Note joints original in molding and containing no tape and really no solder. Coving missing and as a whole, shows very poor workmanship and layout.



Cord run through iron eyes to chandelier in hotel job. Cord goes through plaster with no protection.



Bootlegging Makes Reinspection Necessary*

By W. A. Jackson

Commissioner, Department of Gas and Electricity
City of Chicago

THE principal reason for the great amount of cord and other unapproved and dangerous kinds of wiring in residences is the need for service to radios, refrigerators, heaters, sun lamps and a multitude of other devices continually appearing on the market. The older buildings provide no means of supplying these devices. As a result of the economic depression, the householder has had much time on his hands and very little money, with a result that home-made wiring around the house is coming more and more into evidence. An experienced electrician is seldom employed for this work so that the electrical hazards created depend wholly on the knowledge or skill of the parties doing the work.

What the inspector finds in the cases he comes in contact with, generally does not reflect much credit on the amateur wireman. This usually consists of extensions of cords, telephone, bell or any other kind of wires that come to hand, and run in every possible and conceivable way to get results. Joints are loosely made and there is always the hazard of fire from arcing contacts. Wires are run in contact with piping and with exposed joints there is constant danger of accident.

It must not be assumed from what has been said before that reinspections are necessary only to correct the dangers of uninspected and dangerous extensions to existing wiring. Hazards may develop to wiring which was originally installed in conformity with the Code, but through deterioration and misuse has now ceased to afford the protection originally built into it.

A brief resume of the hazards usually found to exist and the need for their correction by a thorough reinspection are as follows:

(1) *Additions and Extensions:* Usually by the misuse of cords.

(2) *Adequacy of Equipment:* This should provide for 100 per cent of the demand on feeders and circuits rather than a 100 per cent of the connected load, and as provided for in the 1930 Chicago Electrical Code to take care of home and apartment house wiring.

(3) *Fusing:* The misuse of fuses is one of the most common and dangerous practices. Fuse blocks in the earlier type of homes and apartments wired for electricity will probably be found to be of the open link type enclosed in wooden cutout boxes lined with asbestos paper and located in some out of the way place, such as a closet where a permanent short circuit will do the most damage.

(4) *Condition of Insulation:* Insulation in circuit wiring, and most certainly on old fixtures where the installation has been in use for many years, will be found to be such that it is the source of many electrical hazards. Fixture wire in service has about one-fourth the life of the circuit wiring to which it is connected. Open link chain fixtures are subject to hard usage, especially if not controlled by wall switches and after a comparatively short time will be found to be in need of repairs.

(5) *Maintenance:* The replacement of switches and cutout blocks and the use of the proper size fuses will be found necessary if a job is to remain in safe operative condition.

(6) *Condition of Devices:* A complete checkup should be made on the appliances usually connected into a circuit, such as poorly constructed electrical de-

vices which are potential life and fire hazards and also on defective cords to portables.

(7) *Grounding:* It will be found that little attention was given to grounding equipment on the older installations. A poorly grounded job represents a very serious hazard and a reinspection should, most certainly, require the correction of this condition. On the older type of job where the fixtures were required to be insulated and on the knob and tube type jobs, a reinspection would disclose a serious hazard in the use of the insulated fixture installation, especially in bathrooms and laundries, where a person could get into circuit between an accidentally charged fixture and a grounded surface, such as wet concrete floors, and water filled bathtubs.

On account of the enormous amount of wiring of this type and the general ignorance of the public of the hazards involved, it seems that the most effective way to correct the conditions found is by a program of education by the various inspection agencies. It must be understood by the inspector that the public does not know, and, therefore, does not realize the dangers inherent in a faulty electrical installation.

The records of proven electrical fires compiled by the Electrical Bureau of the New York Board of Fire Underwriters show that the losses from uninspected and unapproved electrical devices and materials is 91 per cent of the total proven electrical losses. To what greater percentage this would be raised if the origin of all unknown or undetermined fires could be ascertained, can only be surmised. The record, as it stands, however, is an irrefutable argument in support of adequate reinspection.

*Abstracted from paper on "Need for Reinspection," delivered at Mid-Year Meeting of Illinois Chapter, I. A. E. I.

Contractors' N. I. R. A. Code Revised

SINCE the publication of the proposed N. I. R. A. Code for the electrical contracting industry in the July issue of *ELECTRICAL CONTRACTING*, a number of changes have been made to further clarify and define its operations in accordance with the intent of the Act.

The "Purpose" of the code, as set forth in the preliminary draft, while considerably shortened, is virtually the same. Article 2 entitled "Participation" is not in the revised code, but instead there is a section of definitions of who shall participate. The labor code now known as "Employment Provisions" is virtually the same.

"Rules of Fair Competition" replace former "Industry Regulations." These include all of the ten rules previously given with some of them modified, and in addition, rules covering overhead, a return on investment, trade-in allowances and subterfuges.

The remainder of the code, which deals with the supervision and execution thereof, is virtually the same. Wherever the preliminary code referred to "members," the revised code substitutes the word "contractor" in order to make it industry-wide in application.

New Article 2 "Definitions" defining the participants in the code follows:

Art. II—The term "electrical contracting industry" as used herein is defined to mean the business of selling and/or installing or repairing electric wiring, devices, appliances or equipment.

The term "person" as used herein shall include natural persons, partnerships, associations and corporations.

The term "contractor" as used herein shall mean an electrical contractor, and shall include every person engaged in the business of electrical contracting, who shall have the following qualifications for the protection of the public:

1. He shall be generally qualified by his technical training, and/or experience in the industry, to direct properly the installation or repairing of electric wiring, devices, appliances or equipment.
2. He shall be an employer of labor.
3. He shall have an established place of business, and shall maintain the usual set of books and records incident to the conduct of an ordinary business.
4. He shall be financially able to operate his business properly.
5. He shall subscribe to and abide by the rules of this code.

The term "employer" as used herein shall include every person who employs electrical workers (journeymen, helpers, apprentices or maintenance electricians), for the purpose of installing or repairing electric wiring, devices, appliances or equipment in whole or in part with his own organization, either under contract for other persons or within his own premises.

Although many of the Rules of Fair Competition will be found to be the same as those printed last month, the entire list in the revised edition of the code is here given in order that contractors may have the complete picture:

Rules of Fair Competition

Art. V—Rule 1. The nature of the contracting business requires the preparation of detailed estimates of individual cost for each job. No contractor shall submit an estimate price on any job without retaining a record of his quotation showing the true cost upon which his estimate is based.

Rule 2. No contractor shall sell or offer to sell labor, materials and/or services below the true cost thereof, as defined herein.

Rule 3. The term "true cost" is defined as the sum of:

1. Materials.
2. Labor.
3. Job expense, which shall include:
 - a. Drafting.
 - b. Delivery of materials.
 - c. Railroad fare (or equal) if any.
 - d. Hotel expense, if any.
 - e. Municipal permits, inspection fees, if any.
 - f. Public liability and compensation insurance.
 - g. Group insurance, if any.
 - h. Tool repairs and replacements.
 - i. Any other direct expense.
4. Overhead or administrative expense.

Rule 4. The overhead or administrative expense shall be figured upon the actual overhead percentage of the individual contractor, based upon his experience with the volume and character of his business, as determined by recognized standard accounting methods in the electrical contracting industry; but the overhead shall not in any case be figured as less than 15 percent of the combined cost of—1. materials, 2. labor, and 3. job expense.

Rule 5. To conserve the capital resources of the industry and provide for a return on his investment, the contractor shall add to his true costs a minimum of 6 percent thereof, as a part of his quotation or sales price for each job.

Rule 6. For the purpose of determining costs and to provide a check upon the accuracy and fairness of estimates and quotations, there shall be set up in each locality a Cost Finding Committee with power of review, which shall operate subject to the approval of the National Electrical Contractors Association. The National Electrical

Contractors Association shall gather cost data on labor and administrative expense and make such data generally available to the electrical contracting industry and to the National Recovery Administration.

Rule 7. No contractor shall make any secret agreement with a purchaser concerning any terms of payment, rebate or special conditions not extended to all bidders.

Rule 8. The industry approves of the "one-bid" policy. No contractor shall change his bid price except for variation in wages or material prices, or substantial changes in the original plans and specifications, and then only to the extent of the actual change of cost involved, such changes to be subject to review by the Cost Finding Committee.

Rule 9. No contractor shall submit a bid on any work after the closing time set for receiving bids or after other bids have been opened.

Rule 10. Contractors shall submit bids including temporary work only when the quantities are distinctly stated. Maintenance and cost of current will be assumed only on a percentage basis.

Rule 11. No contractor shall undertake to complete a contract upon which another contractor has temporarily stopped work because of non-payment of amounts properly due.

Rule 12. Contractors shall at all times finance their own payrolls and accounts payable without assistance or guarantees of any sort from owners, builders or suppliers of electrical materials.

Rule 13. Contractors shall refrain from the practice of shopping material prices for the purpose of forcing uneconomic cuts on the part of material suppliers and each contractor shall insist upon the material suppliers quoting their best price first. If a supplier has obviously made a mistake in his bid, his attention shall be called thereto.

Rule 14. No contractor shall offer unreasonable trade-in allowances, or assume unreasonable responsibilities with respect to guarantees of materials furnished or services performed.

Rule 15. No contractor shall sell or exchange any electric materials, devices, appliances or equipment at a price or upon terms or conditions that will result in the customer paying for the goods received less than the true cost to the seller, including handling charges and overhead, provided however that damaged goods, obsolete lines, or inventories which must be converted into cash to meet emergency needs may be disposed of in such manner and on such terms and conditions as the supervisory agency may approve and as are necessary to move such goods into buyers' hands.

Rule 16. Contractors shall uphold the enforcement of all public regulations applicable to electrical work, and shall cooperate to prevent the installation of illegal or inadequate electrical construction work.

Rule 17. The Standard Form of Contract Documents of the American Institute of Architects is to be the basis used for all contracts.

Adequate House Wiring Estimating

By Arthur L. Abbott

THE time-honored method of "estimating" house wiring is to charge so much per outlet. This method of arriving at the selling price, however, never was logical or sensible and it must be evident to anyone that it simply cannot be used in bidding on jobs laid out according to the Industry Adequate Wiring Standards, because the installations are too complex and there are too many variable items. In the April issue, the costs of all details were worked out for a specific example of a house wiring job conforming to the Standards. These figures provide a basis for estimating the costs of similar installations and a practical method of estimating can be worked out, based upon the analysis made of the specific example.

First of all, plans and specifications must be prepared before any intelligent estimate of the cost can be made. The plans must show all outlets and switches and the location of the fixed appliances. If competitive bids are asked for, complete specifications should be drawn up, using the model form as a guide.

If the contractor is called on to make a preliminary estimate without complete specifications, he should first make an outline specification including the following data:

- Number of branch circuits for lighting and small appliances.
- Fixed appliances to be wired for, giving rating of each.
- Service capacity.
- Panelboard circuits to be provided.
- Bell work.
- Telephone conduit.
- Radio wiring.

The first step is to scale off the dimensions of the house and compute the total floor area. This area determines the required number of branch circuits, also the service capacity needed to supply the lighting and small appliances.

The heavy appliance load must next be investigated. Usually the

owner will not have made any actual selection of these appliances, or at least not all of them will have been selected, hence the ratings must be assumed in order to make the calculations. The ratings suggested in the Standards may be used, or preferably, where the promotional work is sponsored by a local league, this organization should compile standard lists of fixed appliances which would be suitable for dwellings of various sizes.

The service capacity can now be found by adding together the wattage for lighting and small appliances and the wattage for the larger appliances, not forgetting to apply the suggested demand factor to the latter load if this is approved by the local inspection department.

Service

As more strictly a part of making the estimate, it is important to ascertain the point at which the service will enter the building. Then a suitable location for the panelboard must be selected. As a general rule, this location should be close to the kitchen, because this general locality will be close to the range, water heater, heaters in bath rooms and the appliance outlets in the heavy load area. Time should be taken to determine the most economical layout, for the feeder from the service switch will usually be no smaller than three No. 4 and the range circuit three No. 6, and these sizes cost quite an appreciable amount per foot.

Cost estimates of 60-amp., 70-amp., and 90-amp. services were given in the April issue. These estimates should be revised to cover the methods that are standard in the locality and figures should also be made up for services to one-story houses, the chief difference in this case being in the smaller amount of material required. The labor item will not be greatly affected by the

type of equipment used or by the height of the building.

The cost of each of these six typical services should be recorded so that the proper total amount may be used in making the estimate on an actual job, without making a new computation in each individual case. The wise contractor will pay enough attention to his work so that he can check the estimated costs against cost records of actual jobs and correct the estimates accordingly.

Feeder

In nearly every installation conforming to the Standards, all or at least a part of the branch circuit cut-outs or circuit breakers will be in a separate cabinet and a connection must be made to this cabinet from the service switch. This feeder may be very short, or it may be of considerable length.

If the feeder is installed in rigid conduit, it is merely a standard run of conduit and wire and the labor may be estimated according to the Manual of Estimating or any other standard data. A considerable part of the labor is occasioned by the elbows. From the cost figures previously given we may deduce a cost for the feeder complete in rigid conduit of 42 cents per foot plus \$1.00 per elbow, and if flexible conduit is used, 42 cents per foot. These figures must of course be re-computed using the local prices for material and labor before they are of any value except as rough approximations.

Panelboard

The majority of house jobs conforming to the Standards will require 12, 14 or 16 plug fuses and two 50-amp. fuses. Some attention should be given to the selection of the most suitable type of equipment for this purpose. For installation in a finished space, a high grade panelboard

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containing cutouts for all circuits, including the range, may be obtained at a reasonable price. For surface mounting in an unfinished space, some saving can be effected by using two panels, one with range fuses and six plug fuses and a "residence type" panel containing as many more plug fuses as are needed. There are, of course, many other possible combinations.

In the discussion of a typical installation a time allowance of 8 hours was made for labor mounting and connecting equipment having 16 plug fuses and two cartridge fuses. The labor would probably be very little less where two or four less fuses are provided. The allowance is about 60 per cent of the panelboard labor given in the Estimating Manual, but this data was compiled to apply to panels having two fuses per circuit and cabinets designed for flush mounting in finished spaces.

Fixed Appliance Circuits

The itemized estimate for each of these circuits included in the article published in April may be used as a guide. For convenience in making up estimates it would be well for the contractor to make up figures for the shortest runs which might be likely to be required in any case, say 10 ft., with a cost per foot for each additional foot of run.

Branch Circuit Work

Since the branch circuit work makes up so large a part of the total cost of the installation, special attention should be given to this item.

The service, feeder and panel board are to be figured separately and therefore the circuit work cost should include only the wiring from the cabinet to the outlets, the outlet boxes and the devices. For armored cable work the suggested items per lighting outlet are as follows:

- 12 ft. No. 12 2-conductor cable
- 2 ft. No. 12 3-conductor cable
- 1 Outlet box
- 1 Box support
- 2 Box connectors
- Miscellaneous material
- Inspection fee
- Labor—0.4 hour

For single-pole and three-way switches and convenience outlets, the cost of the switch or receptacle and 0.2 hour labor is to be added to the above. Possibly more accurate results can be obtained by apportioning a different amount of cable to each type

Summary of Method

1. Secure plans of the house. Mark all outlets and switches on the plans, if this has not already been done.

2. If a complete specification is not furnished by the architect or builder, draw up an outline specification giving the service capacity, number of branch circuits, number and rating of all fixed appliances to be wired for and number of panelboard circuits.

3. Set down the total cost of the service, selecting the proper figure from estimates of typical services previously made.

4. If a feeder of any considerable length is required, figure this at a unit cost per foot that has previously been determined.

5. Set down the cost, including labor, of the panelboard equipment

that has been selected as the most suitable for an installation of the given size and type.

6. Make an itemized estimate of the cost of each separate circuit for a fixed appliance.

7. Compute the cost of the branch circuit work by using unit costs previously worked out for a lighting outlet, convenience outlet, single-pole switch and three-way switch.

8. Make itemized estimates of the bell work, radio wiring and telephone conduit, or use previously computed figures for similar installations.

9. Total the above items to find the total cost of labor and material, then add a reasonable percentage to cover overhead and profit.

of outlet and switch; however, the method here suggested is much more simple and has the advantage that the figures can very easily be checked against the actual cost record of each job.

As more outlets are installed in a given space, the average distance between outlets is decreased and less cable is used per outlet. A check made of several jobs showed that the above quantities of cable are about right where there are 30 sq. ft. of floor area per outlet, this figure being arrived at by taking the total area, as computed for determining the required number of branch circuits, and dividing this by the total number of outlets and switches. Also, it was found that where the number of outlets is fully adequate as per the Standards, area divided by outlets gives an area per outlet of about 18 sq. ft. and in this case the quantity of 2-conductor cable per outlet can be reduced to 10 ft.

Using the current local prices for labor and material, the cost of a lighting outlet, convenience outlet and each type of switch should be carefully computed and the total cost of each entered in a note-book for convenient reference.

There is insufficient space available to discuss here the outlet costs where other types of wiring are used, but it is not difficult to determine the proper unit quantities for any other type and the contractor should apply

the same method to the type of wiring which is commonly used in his locality.

The outlet cost found in this manner is the cost that should be used as the basis for quoting prices on additional outlets, after the original bid has been submitted, and may usually be figured as requiring only the reduced amount of 2-conductor cable, or 10 ft. per outlet.

Furthermore, wherever the work is done according to the Standards, the service and panelboard are completely covered in the original bid; outlets added later do not necessitate any increase either in the service capacity or in the number of branch circuits.

Miscellaneous Systems

The bell work, radio wiring and public telephone conduit are all simple items and costs can easily be estimated. The cost for each of these systems may be worked out on the basis of a typical layout and will not vary greatly between different jobs unless there is a change in the equipment to be installed or the house is unusual in some respect. In the complete example worked out the bell work included two bells and a buzzer, three pushes and a transformer and the labor was figured at 5 hours, which is believed to be a fair allowance for this layout. The total cost of the three items was estimated at \$21.48.

electrical contracting

With which is consolidated Electrical Record

S. B. WILLIAMS, Editor

N. I. R. A. CODE ANSWERS

SINCE the publication last month in ELECTRICAL CONTRACTING of the proposed Industrial Recovery Code of the electrical contracting industry many readers have written for further information.

In the first place, it is not necessary under the Act that a contractor become a member of the N.E.C.A. However, if enough contractors do not join the National to give it the required representation of the industry, then no code will be recognized at Washington, and the relief will not be forthcoming. Furthermore, if no code is considered, the industry may expect the federal administrator to enforce certain labor provisions as to minimum wages and maximum hours without any of the compensating relief that would come from a code of business practice.

It has been stated that an electrical contractor will secure the benefits of the code whether he is a member or not. This is true but non-members must remember that to make the code workable the National must set up certain services and secure certain information. None of this can be had by a non-member except he pay for it. It must also be remembered that non-members have no voice in the making of the code except at the public hearings at Washington. These hearings are expensive to attend.

It is much easier to gain admission to the N.E.C.A. than it was a year ago. The National has waived the entrance fee for the time being and has made a low rate for dues for the balance of the year. Also provisions for chapter control over local membership application is now being simplified so as to enable all electrical contractors to join the National.

An electrical contractor may join the National no matter where he operates. It is not necessary that there be a chapter in his town.

The National has no labor affiliations nor is it in any way committed to any open or closed shop labor policy. It is seeking in its code to fairly represent employers of both union and non-union men.

HOW TO CREATE EMPLOYMENT

THE principal purpose of the National Industrial Recovery Act is to put men back to work. How is the electrical contracting industry going to do that?

There are three ways in which men can be reemployed—by an increase in new construction, by drastic shortening of hours or by the creation of work.

New construction is increasing but its progress cannot be speeded up by the electrical contractors.

The hours of employed men are all too short as it is, without further decreasing them in order to provide a little work for others.

The answer seems to lie in the creation of work and herein is the challenge. What is the industry going to say to the N.I.R.A. administrator when he asks how the electrical contractors are going to increase employment.

Work can be created and here are some of the ways:

1.—*Reinspection.* This does not have to be enforced. It can be sold to the public. Portland, Ore., has created hundreds of thousands of dollars of work in the past year in this way and none of it was rammed down the public's throat.

2.—*Stop Bootlegging.* There will be found elsewhere in this issue suggestions from a large number of cities as to how this may be done.

3.—*Sell Lighting.* The utilities and the lighting equipment manufacturers are promoting a campaign this Fall on lighting. Get behind it.

4.—*Modernization Campaign.* By cooperative advertising and promotion of additional outlets, modern wiring can be sold.

5.—*Promote Adequacy.* Sell every member of the industry the idea of adequacy so that no work will be started without someone selling adequate wiring to the owner.

6.—*Cooperative Market Development.* Work out with local representatives of wholesalers, manufacturers and central stations plans for creating or developing electrical markets that would require wiring.

This list is not complete, dozens of items could be added. It is intended merely to show that it is possible to do something to create more employment.

It will be noticed, however, that in every

instance before work can be created a job must be SOLD.

There is the crux—more sales. Selling will help create employment of wiremen—and will bring business to electrical contractors.

TEACH THE PUBLIC

A STUDY of bootleg wiring made by the editors of ELECTRICAL CONTRACTING, and given elsewhere in this issue, shows the gains it has made and it is small wonder.

The public does not know that there is such a thing as bootleg wiring. It does not know the hazards involved when wiring is done by anybody that is not competent. The public does not know that all wiring should be inspected and why.

For years the public has been lulled to sleep with a false security by the propaganda against the reporting of fires as having electrical causes. The electrical industry feared that the public might be afraid to use electricity if the fire hazard was given publicity. Now the public has virtually no fear and as a result, bootlegging could and did take hold.

Let's teach the public, not in a gruesome way, but in a straightforward manner the necessity for having all electrical work done by competent people and for having it inspected.

Bootleggers never apply for permits. Teach the public always to ask to see the permit.

This requires well-thought out publicity. It should be an industry job. At least it should receive the joint attention of both the inspectors' and the contractors' national associations.

PUBLIC WORKS JOBS

A PART of the Administration's recovery plan is a public work's program involving the expenditure of a vast sum of money. Some of this will be spent by the federal government, some by the state, some by cities.

The projects will be started to provide work for labor. The contractor is expected to pay for this work. Will the government guarantee the sub-contractor that he will get his money?

The government seems to care nothing about the reputation of a general contractor provided he is low and can get a bond. Nor does the government appear to care if a

general contractor and a bonding house connive so long as the work is completed. The government has protected itself by ruling that no liens may be levied on government projects.

This public works program is important, but even so there is no reason why the electrical contractor should donate the electrical work or any part of it.

It is really up to the administration to provide some protection to the sub-contractor.

MODERN HOUSES

A NUMBER of different building construction materials interests are showing model "modern" homes at the Chicago "Century of Progress" World's Fair. With two exceptions all of the ten or more houses shown are very much alike as to general suggestion. While it is doubtful if this type of construction will make any great progress immediately, there are certain things that command the attention of the electrical contractor.

In the first place, the lighting effects of the so-called "modern" type home are and have to be decidedly different. These effects are secured generally by (1) built-in lighting, principally cove; (2) tubular lighting beside or over beds or for walls, and (3) pendant fixtures and portables of unusual design.

Virtually every house had an outdoor roof garden instead of the customary porch. This is going to mean the provision for weather-proof wiring that is inconspicuous. Provisions are made in many for built-in radio speakers.

All of the homes have forced hot-air heat with some kind of air conditioning. The kitchens are fully electric except for the range in a few instances. In fact, considering these kitchens and those shown in the Electrical Building, there are probably more model electrical kitchens shown at the Fair than anything else.

Since these houses are designed to be modern in architecture they must be modern in all living respects. That has been interpreted to mean adequate wiring so far as outlets of various types are concerned.

No attempt was made to introduce any new ideas as to wiring methods because of the new types of construction; but since wall insulation is playing so important a role it is obvious that adequate branch circuits must be given every consideration.

\\ code chats ///

A MONTHLY DISCUSSION OF WIRING PRACTICE AND QUESTIONS OF INTERPRETATION, PRESENTED WITH A VIEW TOWARD ENCOURAGING A BETTER UNDERSTANDING OF THE NATIONAL ELECTRICAL CODE

CONDUCTED BY F. N. M. SQUIRES

ASSISTANT CHIEF INSPECTOR, N. Y. BOARD OF FIRE UNDERWRITERS

PAINTING INTERIOR OF METAL RACEWAYS

In 504-j what is meant by: when combination metal raceways are used, they shall be identified by sharply contrasting colors of the interior finish? Does the electrician have to paint them? If so, how can he do it if it means Wiremold?

This is a Code requirement which has to be met by the manufacturer. In order to be approved by Underwriters' Laboratories each compartment must be painted with a different color and this must be done before it leaves the factory.

Wiremold is not made in a combination raceway. If at any time the manufacturers of this product do make such a device they will have to use the two different color finishes to identify each compartment.

MOLDING FOR UNDERPLASTER EXTENSION

510-c states that when making extensions they shall be laid on the face of the masonry or other material of which the walls or ceilings are composed and then shall be buried in the plaster finish. Does this mean that when an extension is made in Wiremold from an existing conduit job (changing the location of a fixture in an office) that the plaster must be cut out to take the molding, and then plastered over?

What is the objection to having the molding exposed?

Rule 510 deals with "Underplaster Extensions (Concealed)" and, according to 510-b where metal raceways are to be used for this they shall be "approved for the purpose."

Molding is a surface raceway and therefore should not be used for underplaster work. The oval tubings which are made and approved for work of this nature are designed to be laid in a channel cut out of the plaster finish of a fire resistive building and then plastered over.

EXTENSIONS TO COMBINATION RACEWAYS

504-j states that extensions of light and power circuits to and from combination metal raceways shall be in conduit, connected to the raceway.

Why don't they allow these extensions being made by the use of the same type of raceway, as perhaps Wiremold?

This is in order that there may be no splices or taps made in the wire way itself as prohibited by 504-c. If armored cable, for instance, was used there might have to be splices where the cable was connected to the raceway; but with conduit (either flexible or rigid) no splices would be necessary as the wires could be pulled right on through.

This particular sentence of 504-j probably refers to only where a conduit is connected into a run of the raceway. Where the raceway terminates in an outlet box there is no reason why the circuit could not be extended from the outlet box by means of any approved method of wiring. That is, when the raceway ends in an outlet or junction box the circuit may be run from that box in cable, metal moulding, etc., if desired. An extension of the same type of raceway would not be an extension—it would be a part of the raceway system.

PROTECTION OF TRENCHLAY ABOVE GROUND

Where Trenchlay non-metallic service cable runs up a pole from the ground should this be protected from mechanical injury? Does the Code rule on this? If it is protected with iron pipe would there be a choking effect if lightning should go down that way?

Rule 402-c covers this and requires that the cable be protected for at least 8 ft. above ground against mechanical injury.

If the cable had been used for circuit wiring, that is, had been run underground from a building to a pole and then up the pole to a light, the rule would still apply as rule 306 on Yard Wiring says that "All wiring on exterior of building walls shall comply with Section 403."

As to the choking effect to a lightning discharge, it is quite certain that an iron pipe over the cable will exert a choking effect. Probably the discharge would jump from the conductors to the pipe at the upper end and pass on down the pipe.

LEADED ARMORED CABLE FOR UNDERGROUND WORK

Does 505-d mean that A.C.L. cable can be used instead of rigid conduit in concrete buildings, or underground between a house and garage?

According to the Code leaded armored cable can be used underground or in a concrete building. While such construction might not be good engineering it would not create a fire hazard and therefore is a good Code rule.

Such construction, however, is not

Electrical Contracting, August, 1933



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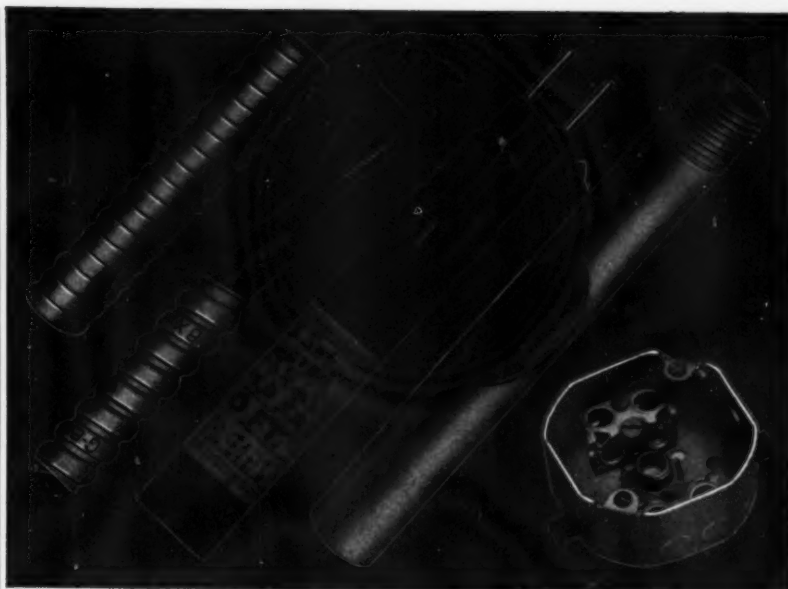
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to be recommended as, of course, in case of a fault developing in the wires, the wire could not be withdrawn and new wire pulled in as would be possible with conduit.

What a mess our concrete buildings would be if wired throughout with armored cable embedded in the concrete!

FUSING BEFORE AND AFTER TRANSFORMERS

What are the wiring requirements for insulating and step down transformers on an inside wiring job. If, for instance, we were to install one or more insulating transformers on a 220-volt power line to obtain 110 volt for lights, is it necessary to install a fused disconnect switch on the 220-volt side as well as on the 110-volt side and again on a 440-volt 3-phase system, if stepped down to 220-volt 3-phase for power, is it necessary to install disconnect switch with fuses on both high and low tension side of transformers?

If the transformers are installed outside of the building on a pole, what are the requirements of the Code with regard to fuses and switches?

The Code requires automatic over-current protection of all ungrounded wires. In an installation such as described above, the wires supplied by the transformer may be protected by fuses either on the primary side or the secondary side of the transformer. If placed in the primary leads care must be exercised that they be of the proper size to protect the conductors.

If, for instance, the installation on the secondary side of the transformer consisted of but a single branch lighting circuit fuses placed in the primary leads would have to be not larger than 6 amps. to give proper protection to the No. 14 circuit wires.

If there was more than one circuit on the secondary of the transformer, of course, each circuit would have to have its own protective devices with ratings of not over 15 amps.

On installations of step down transformers and circuits for lighting as described above there are no requirements for switches other than for the service switches at the points of entrance. Of course, switches may be provided on either or both sides of the transformers. For power

the only switches required other than the service switch, are the motor control switch and the disconnect switch.

In the case of outside transformers there should be a service switch where the service enters the buildings. There are cases of where the higher voltage enters the building through a service switch and then passes outdoors to a transformer and then the secondary enters the building from the transformer. Inasmuch as this is controlled by the main service switch no other switch is necessary where the secondary enters the building.

RADIO ANTENNA SYSTEMS

In studying over the Code concerning the installation of outdoor aerials for radio reception I would like to ask you whether I have the correct understanding:

1. That the aerial wire should not be smaller than No. 14 size, if made of copper.
2. That it may or may not be bare, except that the lead-in entering the building through a non-combustible insulator should be covered with type R insulation, which is 3/64 in. rubber covered.
3. That the approved lightning arrester may be mounted inside or outside the building.
4. That a separate ground wire, No. 14, for the arrester is preferred.
5. That the ground wire may be bare, of size No. 14, and may be secured in any manner, if firm, that is, by nails, staples, etc.
6. That approved ground clamps be used, preferably on water pipe, permissible on steam pipe, but not on gas pipe.

Is the "lead-in," the only conductor where insulation is concerned? And am I correct, that all wiring should be No. 14 size?

Our correspondent has made a correct synopsis of the Code rules pertaining to radio receiving antenna systems. The lead-in wires are the only ones which are required to be insulated and all wires should be not smaller than No. 14 if of copper, nor smaller than No. 17 if of bronze or copper clad steel.

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N.E.C.A.

NEWS AND SERVICE INFORMATION

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Contractors Organized for Industry Welfare

hours shall be developed so that it will eliminate over-production and give more employment.

From the instructions that have been presented to us, it is very important that the electrical contractors be organized and guided by the National Association. In order to accomplish the best guidance, they should be members of it, not only in order to get the benefits of this code, but also that proper representation of the electrical contractors may be had in every locality for the purpose of controlling our part of the construction industry and also to see that no violations of the code are committed. It would be a sad commentary if the electrical contracting group were directed to conform with certain rules and regulations without proper representation locally as well as if they were not properly represented nationally.

I believe that much thought should be given to this phase of the problem by our industry because lack of proper representation in our own line of endeavor by people who are competent to administer fair dealing would be detrimental to the best interest of our industry and instead of improving conditions, it in all probability would make them more unfair.

We have an opportunity that I am sure will not again be presented by any national planning for some time, and accordingly, I believe that it is of the utmost importance that every electrical contractor, whether he be large or small, should be a member and participate in this new form of legislation which, if properly handled is bound to improve our business.

Let us not wait until tomorrow to ask that every electrical contractor appoint himself as a committee of one to call on the rest of the contractors for the purpose of organizing locally and supporting the National Association which in turn will properly represent you. In this way you have the right and the privilege in the promotion of this work to advise and counsel with your executives, all of which is invited and is very important at this time.

I am looking forward to a large increase in membership. It has been increasing rapidly since this new N. I. R. A. has been enacted and should continue until all of the contractors are members.

N. I. R. A. PROGRESS REPORT

Made to N. E. C. A. Members

By President L. E. Mayer

It is my pleasure to submit a report on the progress being made in the preparation of an Industrial Recovery Act code for our industry and to advise that a preliminary code has been prepared for presentation to the Federal Administration.

We have been advised by the Administrator that it will become necessary for us to join forces with the Construction League of the United States, which in accordance with the instructions of the Administrator is to present a basic code for all branches of the building industry. This most recent ruling may have some effect on the code which we have prepared and are ready to present, and only time will give opportunity to get the proper information in regard to this new development.

As I understand it, all branches of the construction industry will be sub-

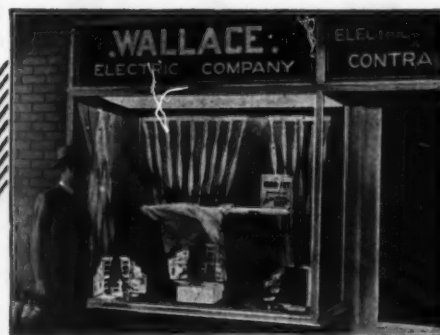
jected to general conditions and in addition thereto, sub-trades will be allowed to set up certain provisions which would be beneficial to their particular branch of the industry. It is my sincere hope that all of the requirements as developed in our code will be acceptable on this new basis.

The matter of labor is an important subject and is bringing about quite a controversial viewpoint. I believe that much alarm is developed without any foundation. I do not believe that it is the intention of the government to change the normal conditions where agreements have been developed or where employers have been working on an open-shop plan. The intent, and that is amplified, is that a minimum wage shall be established, reasonable for the average person to live, and that the maximum

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West Haven:
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IOWA

Davenport:
Davenport Elec. Contract Co.

LOUISIANA

New Orleans:
Odom & Pflueger Elec. Constr.
Progressive Elec. Co.
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THE MODERN THREADLESS RIGID CONDUIT
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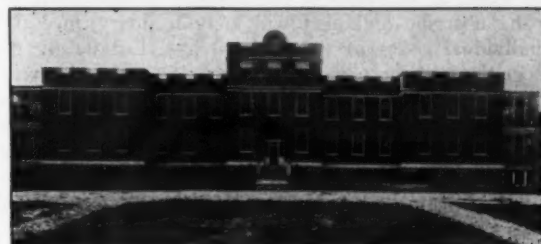
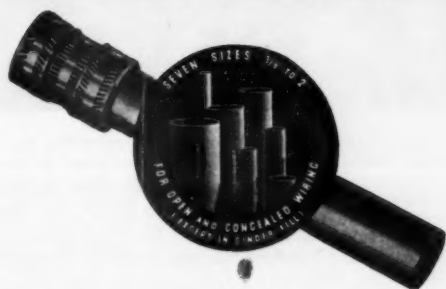
Electrical Division

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CONTRACTING news

INFORMATION OF INTEREST TO ELECTRICAL CONTRACTORS
CONSISTING OF ITEMS OF NEWS, SHORT ARTICLES, PRACTICAL
IDEAS, ETC., OUR READERS ARE INVITED TO CONTRIBUTE TO
THIS DEPARTMENT

BUILDING INDUSTRIES TO UNITE IN N. I. R. A. CODE

The N. I. R. A. Federal Administrator has authorized the Construction League of the United States to organize a N. I. R. A. code committee, representative of all branches of the construction industry, for the purpose of formulating a basic construction industry code. Official communication from the Recovery Administration states:

"This code will contain general clauses in the spirit of the N. I. R. A. to which all branches of the industry can subscribe and also will contain individual codes of the national associations of the various branches of the industry."

The Construction League of the United States, which has its headquarters with the American Institute of Architects in Washington, D. C., has appointed Stephen F. Voorhees, an architect, as chairman of the building industry code committee in the formation of which thirty-four

national professional and trade organizations have been invited to participate.

The National Electrical Contractors Association has been invited to appoint a representative and an alternate to serve for the electrical contracting industry on that committee. President L. E. Mayer will be the official representative for N. E. C. A., with general manager L. W. Davis, as alternate. The first meeting of this code committee was scheduled for July 31 in Washington, D. C.

The plan, as discussed at a preliminary meeting of the Construction League of the United States with national recovery administrators, proposes the establishment of industry control committees locally and nationally to which any branch of the construction industry may refer complaints of violations affecting more than one group, or affecting a violator within one group who needs to be penalized by the reaction of all groups against his malpractices, when

he cannot be controlled by his own group alone.

The Federal administrators have suggested that the question of minimum wages be handled both in the basic code and in the various group codes by using the wording of paragraphs 3, 6, 7 and 8 in the President's blanket code for all employees, and then to further provide that within any city or trading area truly representative groups of employers and employees in any trade or industry may establish, by mutual agreement, additional provisions with respect to labor conditions not in conflict with the intent and spirit of the basic code, which local agreements, subject to approval of N. I. R. A., shall apply to all employers in such area.

TRACY SUCCEEDS BROACH AS PRESIDENT OF I. B. E. W.

H. H. Broach, president of the I. B. E. W., resigned on July 10 because of ill health, and has been succeeded by Dan W. Tracy, who was appointed at a special meeting of the International Executive Council held the following day in Washington, D. C.

Mr. Tracy, who was a vice-president of the I. B. E. W., has been in charge of the seventh district of the union's national jurisdiction since 1919. This district centers in Houston, Texas, where Mr. Tracy has had his home. He will move to Washington at once.

Mr. Tracy was born at Bloomington, Ill., 47 years ago. He is well-known throughout the labor world, and has been particularly successful



CONTRACTORS MEET TO DISCUSS INDUSTRIAL RECOVERY ACT: Approximately 200 electrical contractors attended the meeting held by the Kings County (N. Y.) Electrical Contractors Association on June 29 in the Brooklyn Edison Company auditorium, to discuss the Industrial Recovery Act and its application to the electrical contractors' business. L. W. Davis, general manager of the National Electrical Contractors Association, addressed the contractors on this subject, explained the details of the Act and urged all present to join the Association and help frame the Code. Other speakers were Louis Kalischer and E. A. Holmberg, manager of the Appliance Department of the Brooklyn Edison Company. Mr. Holmberg discussed the New York State sales tax and the regulations laid down by the State Tax Commission as applying to the electrical contractors' business. L. D. Kennedy, chairman of the Kings County Electrical Contractors Association, presided at the meeting.

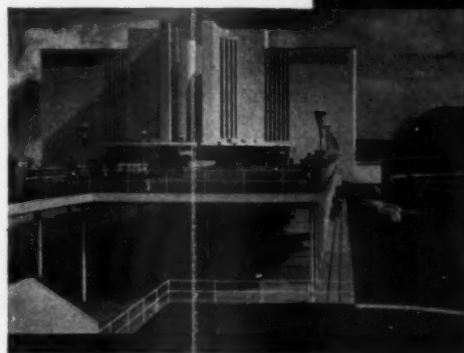
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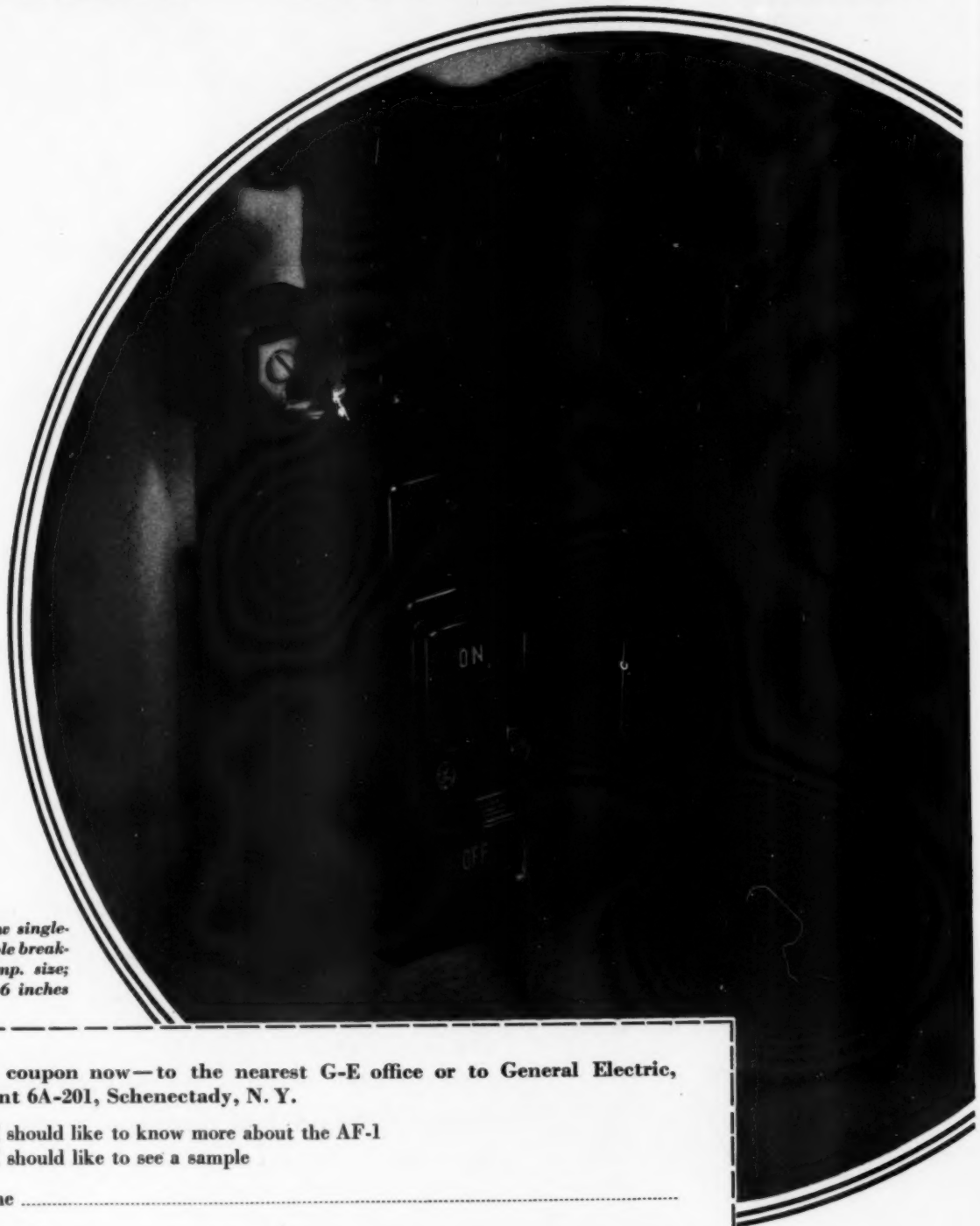


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The Design of this New Breaker
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IT'S ahead because of a unique principle of arc interruption—so efficient that there is no external arc. The contacts are in a closed metal chamber which effectually confines the arc when the breaker opens on overload. Thus confined, the arc is broken under pressure in .008 of a second. *Except for the click of the mechanism when the breaker opens automatically, you would not know it had operated.*

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It does away with the all-too-frequent practice of "bridging" and overfusing. The cover is sealed on, and, therefore, the thermal overload element cannot be tampered with.

It provides for easy and prompt restoration of service. A target shows which breaker has tripped, and a slight movement of the handle recloses it. No time is spent in looking for blown or spare fuses.

It assures safety. If properly installed, no live parts are exposed. And when it operates, *there is no external arc.*

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- Single, double, and triple pole
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in negotiating contracts with employers in a district where unions have not been strongly organized. He has also written agreements with some of the most powerful utility interests in the south.

COLORADO CONTRACTORS MEET TO DISCUSS CODE

The electrical contractors of Colorado Springs and Pueblo, Colo., met with President Guscott, Secretary Stiles and E. E. Stettler of the Denver Electrical Contractors Association on July 20 to discuss plans in connection with the Industrial Recovery Act.

Non-union contractors are now eligible to membership in the Denver association, which formerly only admitted union contractors.

The association has also approved the tentative draft of the N. E. C. A.'s Code of Fair Competition, except for a few amendments now being worked out.

N. I. R. A. DISCUSSED BY HART- FORD CONTRACTORS

About 40 members attended the Electrical Contractors and Dealers Association of Hartford on July 13 to discuss the National Industrial Recovery Act.

Anthony A. Angello was elected president of the association at this meeting, and other officers elected were Clarence A. Metzger, vice-president; James Kessler, secretary; and Charles Hall, treasurer. The executive committee comprises of Arthur Gaskell, chairman; Henry Steinholtz, John Gross, Joseph Rosenblatt, Frank N. Treat and Miles Mosher.

FORM STATE COUNCIL TO CARRY OUT PROVISIONS OF N. I. R. A.

The electrical contractors of Minnesota have decided to form a State Council of N. E. C. A. Chapters for the purpose of carrying out the provisions of the National Industry Recovery Act. Frank Langford, executive committeeman of the National Electrical Contractors Association, is keeping members fully advised of the progress being made by the national organization on the code.

Delegates from the old N. E. C. A. chapters operating in Minneapolis, St. Paul and Duluth will be elected

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to attend the State Council, as well as members from the Minnesota Electrical Association. The rural contractors will also organize a chapter and send delegates to the council. All members of these various chapters will automatically become members of the N. E. C. A.

The officers elected in the Minneapolis Chapter are F. M. Tripp, president; George Svendsen, vice-president; B. E. Arntsen, secretary and Charles Arrick, treasurer. Members of the board of directors are Frank Langford, Art Ingebredtsen, P. L. Byron, W. T. Leeper and John Helm. The delegates to the State Council will be Frank Langford and F. M. Tripp.

JACKSONVILLE CONTRACTORS ADOPT N. E. C. A. CODE

At a meeting of the members of the Jacksonville (Fla.) Chapter of the National Electrical Contractors Association, held July 10, the electric dealers and contractors adopted the proposed N. I. R. A. code as drafted by the National Electrical Contractors Association.

INDUSTRY-WIDE LIGHTING ACTIVITY PLANNED FOR FALL

An industry-wide lighting activity to develop local lighting drives backed by national cooperation will be launched this Fall by the Edison Electric Institute. George E. Whitwell, chairman of the sales committee, has appointed a special committee consisting of M. E. Skinner, chairman; H. F. Barnes, General Electric Co.; J. F. O'Brien, Westinghouse Lamp Co., and C. E. Greenwood to work out the details of this program.

In a series of circulars, letters and other direct-mail methods of stimulation, the utilities, together with lamp and lighting equipment companies will be mobilized for local activities. Mr. Whitwell stated, "This is not to be regarded as a campaign. It is a program with national stimulation to effect local cooperative action."

All branches of the electrical industry have been invited to participate and assist locally in setting up a plan of procedure to further the cause of good lighting in their respective communities and also trade organizations interested in the merchandising of lamps and lighting



Reliable motors for reliable contractors—*everywhere*

Electrical contractors know how good General Electric motors and control are. They know that these motors give their customers good—dependable—efficient service. **G**, Graybar's nationwide distribution service on these motors is equally good, equally dependable, equally efficient. It brings you just the motor or control you want to meet your customer's requirements. And it makes these motors—or any other electrical product—readily available by maintaining a warehouse in your own vicinity.

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*It will be to your advantage
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GASOLINE SERVICE STATIONS and in HAZARDOUS locations, to meet the present Code Ruling, RALCO make a full line of Fittings, Junction Boxes, Straight, Swivel and Elbow Type Unions, Interlocked Receptacles and Plugs all for that special purpose.

INSIST on the RALCO LINE—Impress upon your Jobber that you want NO SUBSTITUTES. Refuse the "Just as Good" kind and feel secure that your work will pass inspection with RALCO APPROVED Material. Immediate supply from large factory stocks are available on short notice if your jobber's stock is low.

Heavy Duty Receptacles and Plugs

20 to 100 Amps.

250 Volts D. C. 600 Volts A. C.

When you have need for a reliable disconnecting device for Portable Machinery or Equipment, for 2, 3 or 4 pole service, REMEMBER, RALCO can supply your needs and the prices are right.

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equipment. The major advertising and sales promotion will come from local groups, in which the utility, manufacturer, jobber, retailer, electric leagues and others will plan drives to fit their own conditions. Lamp and fixture manufacturers who advertise nationally will tie-in their advertising with the activity during October and November.

N. E. M. A. CODE GETS HEARING

Hearings on the National Electrical Manufacturing Association's code of fair competition were started by the N. I. R. A. administration on July 19. Upon conclusion of the hearings, the code went to the Federal Administrator for final decision, which had not been made up to the time of going to press.

The proposed code contained proposals of minimum wages of 35 cents an hour and a maximum 36-hour work week, with exceptions in the cases of casual and incidental laborers and learners.

WHOLESALE TO MEET IN BUFFALO TO DRAFT CODE

The National Electrical Wholesalers Association will hold its convention at the Hotel Statler, Buffalo, N. Y., during the week commencing August 14, for the purpose of drafting a N. I. R. A. Code.

Members have been requested to submit suggestions of rules that should be incorporated in the electrical wholesalers' code, in order that a great deal of preliminary work may be done in advance of the action that the association will take. There have been no less than sixty such rules recommended to date.

I.A.E.I. TO HOLD FIRST NATIONAL MEETING IN CHICAGO

Instead of holding annual meetings in each of its five geographical sections this year, the International Association of Electrical Inspectors will hold a meeting of the entire association at the Congress Hotel, Chicago, during the week of September 11 to 15. This is the first time this has been done. The meeting will also celebrate the fifth anniversary of the International.

Each day of the meeting will be devoted to one of the major groups

of the industry. Monday will be Safety Day; Tuesday, Electrical Manufacturers and Wholesalers Day; Wednesday, Electric Utilities and Electric League Day, and Friday, Electrical Contractors Day. Thursday will be devoted to business meetings of the sections when the election of section officers and other business will be transacted.

Special reference to inspector cooperation in the National Industrial Recovery Act will be one of the major topics discussed at this meeting.

The Century of Progress has set aside Wednesday, September 13, as "Electrical Inspectors Day," and a special program is being arranged for this day.

V. H. Tousley, secretary and treasurer of the International, has stated that an attendance of 500 is expected.

NEW RICHMOND CODE INTERESTING

An interesting experiment in local code clarification has been tried by Richmond, Va., in its new electrical code which became effective in April of this year.

The code is introduced by a preface by Chief Electrical Inspector T. W. Bowry. The code which follows is written in simple understandable language. Each paragraph has a heading clearly stating the intent thereof.

In the preface Inspector Bowry states that although the code does not absolutely bind the inspection department to the specifications of the National Electrical Code and the

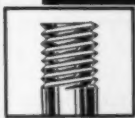


SELLS ONE-TRIP IDEA: Martin H. Schultz who has been in the electrical business in Racine, Wis., for 10 years is ready to sell the idea of the one-trip electrician. To do this he had his truck especially constructed to carry tools and supplies and painted the truck a different color on each side. The truck carries a lot of advertising to emphasize the economy of this "one-trip" service.

CHECK these features . . . then decide!



"Continuous Process" Controlled and used exclusively in the manufacture of Fretz-Moon Conduit. The only process that assures production of Conduit that is absolutely uniform and free from imperfections that might cause installation troubles.



Sharp, Clean Threads All three brands of Fretz-Moon Conduit have accurate, fast-running threads, free from rough spots and burrs. Fretz-Moon Conduit threads easily on the job and does not wear dies.



Easy to Bend and Cut Tests and actual use prove that Fretz-Moon Conduit bends one-fourth easier than ordinary conduit. It bends without flattening or distortion. Clean cuts are made easily and quickly.



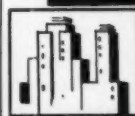
Tough, Smooth Enamel Inside All three brands of Fretz-Moon Conduit are coated inside with a special baked-on enamel that provides a glass-like, fast-running raceway. The enamel is tough and will not crack in bending.



Wear-Resisting Galvanized Surface The galvanized brands (Electro-Galvanized and Hot Dipped) are protected against corrosive conditions by zinc either galvanized electrically or by the hot-dip alloying process. The galvanizing will not flake even under severe working.



Easy-Fitting Couplings Fretz-Moon Couplings are absolutely true, and have inside threads just as sharp, clean and accurate as on the conduit. Fretz-Moon Couplings and Conduit make noticeable savings by speeding up installation.



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Fretz-Moon Conduit is manufactured in three finishes. ENAMELITE—black enameled inside and out. ELECTRO GALVITE—electro galvanized outside and enameled inside. HOT DIPPED GALVITE—hot galvanized outside and enameled inside.

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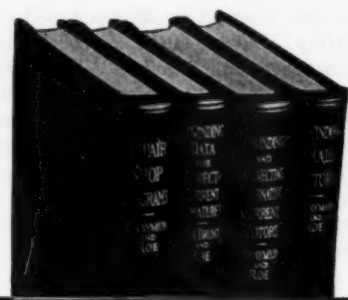
Underwriters' Laboratories approved list, "the inspectors will adhere to the National Electrical Code and the findings of the Underwriters' Laboratories as far as it is practical to do so. The Electrical Inspection Bureau of the City of Richmond is not equipped with facilities for testing and examinations comparable with those of the Underwriters' Laboratories and will not attempt to duplicate the work of the Laboratories by making tests of materials and appliances of the types which have been or may be tested by the Underwriters' Laboratories. Compliance with the National Electrical Code will insure approval by the City electrical inspectors. Materials and appliances which are approved by the Underwriters' Laboratories, Inc., will be approved for use in the City of Richmond and materials and appliances which have been rejected by the Underwriters' Laboratories will be disapproved in Richmond. Electrical materials and appliances which are to be offered for sale in Richmond at retail must first receive the approval of the Electrical Inspection Bureau."

MANY SPECIAL RULES IN NEW SAN FRANCISCO CODE

Many departures from the National Electrical Code in stricter requirements and material limitations are found in the new wiring rules just adopted by San Francisco. Some of these requirements follow:

Electric metallic tubing is not permitted for service. No service conduit less than 1 1/4 in. permitted. Multiple conductor service cable is permitted but conductors must not be smaller than No. 4. Such cable is not permitted for any use except services. Bus service requirements are detailed. Bare neutral service is permitted. Main service switches and fuses may be omitted when size exceeds 1200 amp. and in other occasions. The meter sequence is determined as after the service switch on loads under 100 amp.

Knob and tube wiring on residential work is permitted, though armored cable, non-metallic sheathed cable, and wood moulding are not. Rigid conduit is to be used on all work except dwellings and flats. Flexible conduit can be used except for services, or in new work, or for ground-



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Here is all the information you need in order to determine what changes various types of motors permit; to lay out new windings for specified service conditions; and to handle every step in the work with satisfactory results.

Covers all types of motors, from those used in small household and commercial appliances of all kinds, to mining and railway motors. Explains principles underlying the different types of windings; gives definite instructions for doing the various rewinding jobs. Also gives many data, tables and diagrams constantly needed by the repair man, including data difficult to get from any other sources.

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ing conductors. Armored cable can only be used by special permission.

No black enameled pipe may be used, all conduit must be galvanized, sherardized or hot dip galvanized. A six months' period to clean out stocks is given. Electric metallic tubing is permitted for circuits up to 600 volts, and No. 4 wire. Non-metallic surface extensions are not permitted. Conductors are required to be covered with flame retarding, moisture resisting braid.

Demand calculation of Section 613, N. E. C., are not in effect. Flexible cords, except on a limited number of portable lamps, are not allowed in show windows. Panelboards are limited to 40 circuits, single fusing, 20 circuits, double fusing. Appliances of 1500 watts or more must be switched or provided with approved disconnecting plug; metal frames must be grounded. Three-wire circuits are not permitted unless in complete single fusing, identified neutral installation, with voltage not exceeding 150, and then only for either lighting or convenience outlet circuits, but not mixed. The same goes for multiphase circuits.

Circuits, domestic, are limited to 12 outlets, or 25 medium base sockets, or not more than 1000 watts to the circuit. Stores are permitted 1500 watt circuits, industrials 4000-watt circuits. Stores must provide a minimum of 2 watts per sq. ft. for lighting, industrials 1 watt per sq. ft. Show windows must provide a convenience outlet for each 50 sq. ft. of floor space in addition to the lighting. Convenience outlets are all to be wired on separate circuits, and with no wire smaller than No. 12, and fused at 20 amp., 125 volts. In domestic circuits, eight single or duplex outlets may be installed; in stores only six single, or three duplex. A new schedule of demands is listed for fixed appliance loads.

COMSTOCK HEADS NEW YORK MERCHANTS ASSOCIATION

L. K. Comstock, chairman of the board of L. K. Comstock & Co., and formerly president of the Electrical Guild of North America, was elected president of the Merchants' Association of New York at its annual meeting on June 8. For many years Mr. Comstock was a member of the executive committee of the National Electrical Contractors Association and chairman of its Chamber of Commerce committee.

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In Sizes $\frac{1}{2}$ " to 5"
Suitable for All Types
of Expansion and
Contraction Work





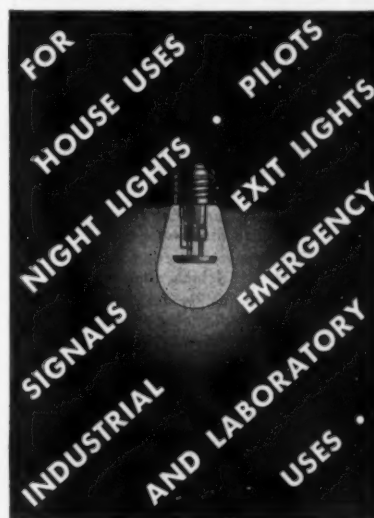
End Fittings Solderless Connectors
Cable Supports Bakelite Moulds
Insulated Bushings and Specialties
Solderless Lugs Expansion Fittings

Write for
Our New
Catalog No. 3

O. Z. Cable Support Co.
Agents in All Principal Cities
45 Bergen Street Brooklyn, N. Y.

At the new
popular prices...
**NEON GLOW
LAMPS** find wider
uses and daily
increasing sales

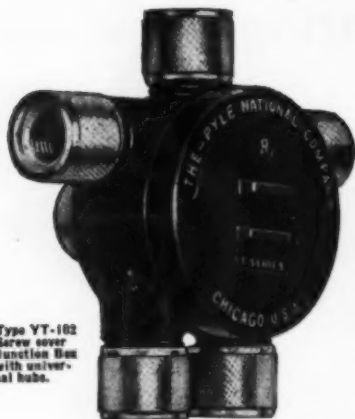
Count the many uses—and you see at once the possibilities for sales and profits in the NEON GLOW LAMP. At new, drastically reduced prices, too, new uses are being found—raising the demand steadily! The sturdy Neon Glow Lamps give over 3,000 hours continuous service. Available in $\frac{1}{4}$ to 3 watt sizes. Consume only a few cents worth of current per month. Sell by the hundreds—for exit



lights; night lights in bathroom, nursery, sick room, stairways, etc. For countless industrial uses, as pilots, signals. For laboratory purposes. Write for details, types, prices. General Electric/Vapor Lamp Company, 867 Adams St., Hoboken, New Jersey.

GENERAL  ELECTRIC
VAPOR LAMP COMPANY

567 Cogr. 1933, General Electric Vapor Lamp Co.



Type YT-102
Screw cover
junction box
with univer-
sal hubs.

SELECT THE RIGHT EXPLOSION PROOF FITTING FROM THIS COMPLETE LINE

Every requirement of gasoline pump and similar hazardous-location wiring can be met easily and economically with the fittings of the Pyle-National line. These explosion proof fittings have substantial cast iron bodies, with generous wiring space and are available in the following types:

- Circuit Breaker Fittings for fractional horsepower motor wiring
- Light Control Switches
- Screw cover Pump Entrance Fitting
4 inch diameter cover
- Screw cover Junction Boxes
2 9/16 and 4 inch diam. covers
- Screw cover Utility Junction Boxes
4 inch diameter covers
- Unions, 1/2 to 1 1/4 inch
- Ells, 45 and 90 deg., 1/2 to 1 inch
- Sealing Fittings, 1/2 to 1 inch

Listed by Underwriters Laboratories for use in Class I, Group "D" hazardous locations.

Write for Bulletin 168-E with complete descriptions of all types and sizes.

The Pyle-National Company
1334-58 North Kostner Ave., Chicago, Ill.

Mail Coupon for Bulletin 168-E

Address The Pyle-National Company,
1334 N. Kostner Ave., Chicago, Ill.

Name

Address

NEWS MANUFACTURERS

A DEPARTMENT FOR THE ANNOUNCEMENT OF ACTIVITIES OF MANUFACTURERS THAT ARE OF INTEREST TO CONTRACTORS, SUCH AS CHANGES IN EXECUTIVE PERSONNEL, BRANCH OFFICES, NEW PRODUCTS, ETC.

G. E. SECOND QUARTER ORDERS GAIN OVER 1932

Orders received by the General Electric Co. in the second quarter of 1933 amounted to \$35,539,858, compared with \$35,304,070 in the corresponding quarter last year, an increase of about 1 percent. Orders for the first six months of 1933 amounted to \$61,051,502, compared with \$68,708,712 for the first half of 1932, a decrease of 11 percent.

Sales billed for the first six months of 1933 amounted to \$61,773,414.19, compared with \$80,210,489.15 for the corresponding period last year, a decrease of 23 percent.

NEW P&S ALABAX CATALOG

Pass & Seymour, Inc., Syracuse, N. Y., has recently released its new Alabax Catalog, No. AL 1. This new catalog covers the complete line of Alabax porcelain lighting fixtures and there are devices suitable for a wide variety of installations, either residential, commercial or institutional.

Bakelite Corporation, Bound Brook, N. J., has prepared a brochure, "The Versatile Service of Bakelite Resinoid," which pamphlet sketches very briefly the origin, manufacture and industrial applications of many types of Bakelite products created from the initial resinoid.

R C A Victor centralized sound systems are fully described in a recent catalog published by R C A Victor Co., Camden, N. J. This catalog contains general description and methods of application; velocity microphones; rack mounting equip-

ment; directional baffle loudspeakers, and portable sound equipment and universal amplifiers. The different units are illustrated and diagrams are shown of various installations.

In addition the catalog contains a section devoted to portable R C A Victor sound systems.

WIREMOLD ANNOUNCES LINE OF ARMORED BUSHED CABLE

Wiremold Co., Hartford, Conn., announces the formation of a new division for the purpose of manufacturing armored bushed cable. The new product will be marketed under the trade-name of "Wiremold Armored Bushed Cable."

This new division, which has been equipped with automatic machinery of greatly improved design, expects to be in full operation and prepared to fill orders on August 1.

The new product will be sold to and through the electrical wholesaler exclusively.

Catalog No. 48 dated May, 1933, superseding issue dated July, 1930, has been issued by Roller-Smith Co., New York City. This catalog describes the switchboard and panel instruments manufactured by this company. It is illustrated and in addition to descriptive matter, contains price-lists and dimensions.

"Protection Against Light Failures," a pamphlet published by Kohler Co., Kohler, Wis., describes the various uses of the Kohler electric plant. The pamphlet contains illustrations showing how the electric plant can serve in emergencies in stores, theatres, schools, churches, hospitals, etc.

August New Products

Starting Switch

A small, hand-operated starting switch for providing complete protection against stalled-rotor current and injurious overload conditions, has been developed by the General Electric Co., Schenectady, N. Y. for use with either



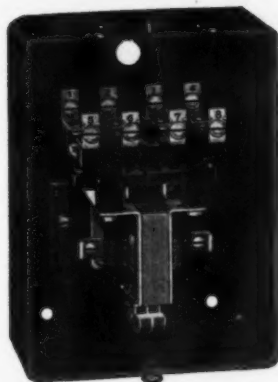
single-phase a.c. or d.c. fractional h.p. motors. A.c. switch is available in single and double-pole forms. The switch, designated as CR1061, has the following features: Complete overload protection, a positive snap-action mechanism which is trip-free on overload; compact construction, and adaptability for mounting in enclosures. All molded parts are made from Textolite and large contact tips are silver. Switch is available in open-type, enclosed-type and for Class I, Group D hazardous locations.



Open Side Pipe Vises

The Toledo Pipe Threading Machine Co., Toledo, Ohio, is marketing a line of open side pipe vises in three sizes as follows: No. 00, capacity $\frac{1}{8}$ in. to $1\frac{1}{2}$ in. pipe inclusive; No. 0, capacity $\frac{1}{8}$ in. to $2\frac{1}{2}$ in., and No. 3, capacity $\frac{1}{8}$ in. to $4\frac{1}{2}$ in. pipe inclusive. Vises have a heavy frame and long full over-lapping vise jaws. Jaws are made from tool hardened steel, and when they become dull may be replaced. Units have over-size handles, extra long. Manufacturer also claims that vises are excellent for fitting make-up work, as jaw construction permits working close to face of vise and will hold copper as well as iron or steel pipe.

Electrical Contracting, August, 1933



Contactors

Allen-Bradley Co., Milwaukee, Wis., announces a line of solenoid operated a.c. contactors. Units can be furnished with or without enclosing cabinets, made in single or multiple pole construction with silver-to-silver contacts up to and including an 8-pole unit for 2-wire control. Contacts are supported on self-contained insulating cross pieces, requiring no slate panels and can be mounted directly on metal panels or machines, permitting several units to be mounted together in a small space. Operating coils can be furnished for any frequency in voltage, 6, 12, 24, 110, 220 being standard. Ratings of contactors range from 5 to 30 amp., depending upon the type and the voltage of the application.

Mercury Switch

A mercury switch that is refractory protected to confine the arc has been announced by Westinghouse Lamp Co., Bloomfield, N. J. Unit has nominal ratings from 3 amp. to 50 amp., single pole, single throw, operated in either



a.c. or d.c. circuits. Contact in switch is made by an impact between two pools of mercury within a refractory chamber encased in heavy glass walls. Switch has a glass seal for terminal wires and is totally enclosed and hermetically

sealed. The six refractory protected switches in the Westinghouse line have flexible leads of from 6 to 8 in. long, and are available with special mounting clips to facilitate installation. In diameter switches vary from .410 to 1.270 in. and in overall length from 2 to $4\frac{11}{16}$ in. not including leads.

Mercury Flasher

Reynolds Electric Co., Chicago, Ill., announces DMO mercury flasher, made with one or two circuits to flash on or off, alternating sides or two colors overlapping. Unit is equipped with one



or two mercury tubes which handle 30 M.A., 15,000 V. transformer or a 1,000 watt lamp load per tube, furnished for a.c. 110 volt, or 220 volt, 60 cycle or 50 cycle current. Motor is of shaded pole disc type and adjustable for speed 18 to 30 R.P.M. and 30 to 60 R.P.M. Unit can be installed indoors, outside or in the sign.

Small 30-Amp. Switch

Colt's Patent Fire Arms Mfg. Co., Hartford, Conn., announces a small 30 amp. 2 pole, solid neutral switch for oil burner and refrigeration installations, known as Colt-Noark Switch No. 513. It is of dualbreak construction, front operated, and despite its size provides sufficient space for wiring without removing block, and is furnished with means for locking in "off" position if desired. Switch can also be provided with facilities for easy connection of a thermostat or limit control device in series with other apparatus, and so equipped is known as No. 513L.

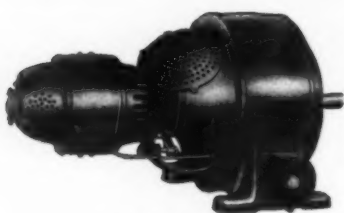
Expansion Fittings

A line of expansion fittings ranging from $\frac{1}{2}$ in. to 5 in. has recently been announced by the O. Z. Cable Support Co.,



Inc., 45 Bergen St., Brooklyn, N. Y. The fitting consists of a sleeve which is threaded to the conduit at one end, but free to move with expansion and contraction at the other end. The fitting is provided with insulated bushings between conduit and sleeve. At the movable end there is a packing ring to exclude moisture as well as a copper ring for ground connections.

August New Products



A. C. Generators

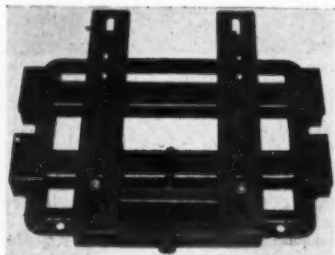
A line of a.c. generators has been announced by Marble-Card Electric Co., Gladstone, Mich., ranging from 0.6 KVA to 75 KVA capacity. Generators are of separately excited type and have the d.c. exciter bolted directly to main generator frame. Two ball bearings are used to support exciter shaft and two for the main generator shaft, the two shafts being coupled together by flexible coupling. Three phase, three wire and four wire machines, as well as single phase, two and three wire types, are built in all standard sizes up to 75 KVA, 3 phase, and up to 50 KVA, single phase.

Automatic Oilers

Two types of automatic oilers known as "Constant Level" and "Thermal" are announced by Speedway Manufacturing Co., Cicero, Ill. The constant level oilers are designed for use on electric motor bearings and other reservoir bearings with oiling, packing, or ball or roller bearings. Oil is maintained at a determined level by means of a tube which permits air to enter and oil to flow from reservoir when level of oil in bearing reservoir drops below the fixed and proper level, automatically stopping the flow of oil when this level is attained. The thermal oilers, designed for use on sleeve bearings of the open type, are operated wholly by change in bearing temperature. Heat in the bearing causes an expansion of air in the thermal chamber, forcing small quantities of oil to the bearing. Both types have a visible oil supply. Manufacturer claims that the oilers have controlled lubrication; automatic oiling and elimination of oil dripping on the floor.

Motor Base

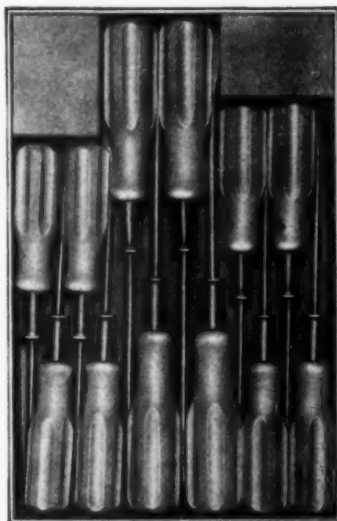
A sound-isolating base for motors has been developed by General Electric Co., Schenectady, N. Y. Floating members are suspended on specially developed isolating material, enclosed and mounted. Motor is mounted as on a standard sliding base and belt tension and motor alignment are maintained in ordinary



manner. Bases are available for the following motor ratings and speeds: Poly-phase induction motors of 1 to 50 hp., 900 rpm.; $\frac{1}{4}$ to 30 hp., 1200 rpm.; 1 to 3 hp., 1800 rpm; single-phase motors of $\frac{1}{2}$ to 2 hp., 900 rpm; $\frac{1}{2}$ to 2 hp., 1200 rpm.; 1 to 5 hp., 1800 rpm.

Wood Handle Screw Drivers

The Forsberg Manufacturing Co., Bridgeport, Conn., announces a new line of wood handle screw drivers. The handles are made from clear maple, lacquered in natural color, with deep machine cut



grooves in handle. The special features of the Supergrip line are embodied in these handles. The blades are made of high, carbon tool steel hardened all the way, even up inside of the handle, and so constructed that they will not turn or bend. These screw drivers are made in all popular sizes in both the machinist and electrical or cabinet types.

Electric Door Chimes

A new model of electric door chimes known as "Telechime Duo-Tone" has just been announced by General Kontrolar Company, Dayton, Ohio. Unit consists of a patented electric action which operates two full-length tubular chimes alternately when door push-button is pressed. Reinforced top construction of chime tops guarantees tone permanency and tone quality, according to the manufacturers. No hole in the wall is required as the model is surface mounted. The chimes can be operated from house current through a 6-volt transformer furnished with the chimes, or they can be operated on 6-volt direct current. The chimes are made of chime alloy and finished in natural alloy, polished and lacquered, or chromium plate and polished.



Vibrator

Reynolds Electric Co., Chicago, Ill. announces the Reco vibrator for vibrating strings or ribbons producing motion and optical illusions of flowing effects, and used by advertisers and displaymen. It can also be used to flash electric lamps within a range of 200 to 300 flashes per minute for various illusions, like rain, steam or waterfalls in transparencies. It operates on either d.c. or a.c. Dimensions are $3 \times 2 \frac{1}{2} \times 2$ in.

Air-Conditioning Units

General Electric Co., Schenectady, N. Y., announces two types of air conditioning units for use in offices, apartments, club rooms and homes. The G-E air conditioner (for radiation systems), with a self-contained condensing unit, may be installed in place of the ordinary radiator, and will heat and humidify in the winter, cool and dehumidify in the summer, ventilate, circulate, etc., all the year round. The G-E air conditioner (portable type), is for summer air conditioning, with self-contained condensing unit. This type unit is designed to cool, dehumidify and circulate the air.



Splash Proof Motors

Century Electric Co., St. Louis, Mo., announces a line of splash proof motors from 1 to 30 hp. Frame and end brackets of motors are of refined grey iron castings. One way ventilation is provided by intake and outlet openings in the lower section of end brackets. Bearing bracket is fitted to frame by long contact sealed fit. Cartridge type grease lubricated ball bearings are used on all sizes.

Electrical Contracting, August, 1933



Keep Motors Running with SpeedWay Oilers
Constant Level

30-DAY TRIAL

Write for Contractors' discounts, sales help and 30-day Trial Plan

SpeedWay Mfg. Co.
1840 So. 52nd Ave.
Cicero, Illinois

SPECIFY
"Latrobe"

FLOOR BOXES—ACCESSORIES
"BULL DOG" INSULATOR SUPPORTS
"KEYSTONE" FISHWIRE
CONDUIT BENDERS

All manufactured by Fullman Mfg. Co. and carried in stock by over 300 jobbers—Send for Catalog No. 225.

FULLMAN MFG. CO. - LATROBE, PA.

Subscribers

You can't afford to miss a single issue

Give us your new address if you have moved

CHARLES H. LEMBCKE
Charles H. Lembcke, vice-president and one of the founders of the All-Steel-Equip Co., Aurora, Ill., died suddenly at his home in Aurora on July 2, from a heart attack. Mr. Lembcke was 51 years old.

Mr. Lembcke was born in Chicago and came to Aurora in 1909 as traffic manager for the Lyon Metallic Company. He left the latter concern in 1921 and with Axel Nelson, now president of the Aurora Steel Products Co., and George Herteau, formed the All-Steel-Equip Company.

Mr. Lembcke was first secretary and treasurer of the company, and later became vice-president.

Graybar Electric Co., New York City, announces the appointment of C. H. McClean, assistant manager of its Kansas City office.

Mr. McClean has been associated with Graybar since 1913, and all but a few months of this period has been spent in the Kansas City office, where in recent years he served as credit manager.

General Electric Co., Schenectady, N. Y., has recently published bulletin GEA-1755, covering CR7505-K1 Photoelectric Relay; bulletin GEA-1746 on a new oil-resisting, heat-resisting cable, known as Glyptal-cloth insulated cable, and bulletin GEA-1761, covering CR-1061 motor-starting switches for fractional horsepower motors.

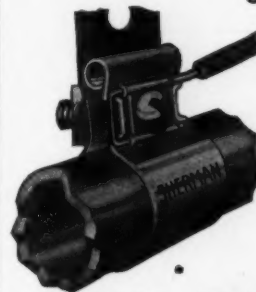
Van Cleef Bros., Chicago, Ill. have recently established a warehouse stock with Mulligan-Midtown Warehouse Co., Inc., 601 West 26th St., New York City, in order to give quicker service to users of Dutch Brand tapes in the New York City area.

A new catalog (Folio T) available for distribution to the trade, illustrating fixtures $\frac{1}{4}$ scale especially adaptable for use in taverns, grill rooms, restaurants, etc., has been published by Gruber Brothers, New York City.

A new 6-page bulletin has been issued by Wagner Electric Corporation, St. Louis, Mo., covering long-hour-duty split-phase motors. Full description is given on all motor parts, together with illustrations.

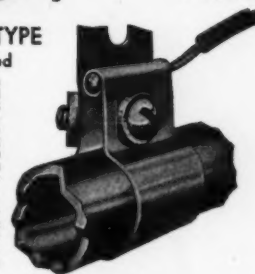
SHERMAN GROUND CLAMPS

ALL COPPER—ONE PIECE
SL Type



SOLDER TYPE
Approved

The original type—Can be used with or without soldering, but approved for use with soldering only. Wire can be tightly clamped in roll portion before soldering. Can be used without solder by wrapping wire around bolt under the washer. Counterlink prevents loosening.



The latest type of clamp combining the advantages of the well-known Sherman Soldered Ground Clamp with an improved solderless connection. Cannot work loose—easy to apply. Gives a positive and rigid solderless connection. Can be used as a soldered type by soldering wire in roll portion.

Order Thru Your Jobber

H. B. SHERMAN MFG. CO.
BATTLE CREEK, MICH.

MINERALLAC PRODUCTS



1.



2.

HANGERS FOR CABLES & CONDUITS

Easily the best for quick, low-cost installation work. Send for full details and costs.

1 Hanger without Porcelain Bushing. Spring steel; stronger, quicker, more compactly arranged.

2 Hanger attached to steel beam with bolt and nut.

3 Jiffy Clip—quicker, neater work at less cost.

4 Cable Joint or Pot-head Compound—8 grades for every system, underground or overhead.



JIFFY CLIPS



Insulating Compounds

MINERALLAC ELECTRIC CO.
25 North Peoria Street, Chicago, Ill.

THE HANDLE IS →
NON-INFLAMMABLE
NON-CORROSIVE,
SHOCK-PROOF
AND GIVES YOU
A POSITIVE
GRIP

and
approved
by under-
writers



Do you play
SAFE with
the tools you
buy?

The Improved **SUPER-GRIP** De Luxe Screw Driver

—you can't get a shock through its highly protective, non-inflammable, non-corrosive handle; you won't bend or break the chrome nickel molybdenum steel blade under actual service and you don't pay but a few cents more for it.

The next time your wholesaler's salesman calls, ask him to show you **SUPER-GRIP**—try it, test it, feel the non-slipping grip of that improved handle.



Why the Forsberg is the best hacksaw blade for your use:

- 1—Non-clogging large round gullet.
- 2—Keen, long-life cutting edge.
- 3—Less strokes with these undercut teeth.



Ask your jobber's salesman
or write direct to

The Forsberg Mfg. Company
Bridgeport, Conn. Dept. C

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Youngstown Sheet and Tube Co.,
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PROFIT BY USING GREENLEE TOOLS

THE greater the efficiency of the tools you use, the more chance you have for meeting competition and for making a profit on each job. That is where Greenlee Conduit Benders and Knockout Tools come in. They cut costs on every job where they are used.



Hydraulic Conduit Benders

Greenlee Hydraulic Conduit Benders insure profits because they bend conduit quicker and easier than by other methods. In addition, they make smooth, even bends, eliminating many fittings and making it easy to pull in wire. They are easy to take to the job, too, because they are portable.



Knockout Tools

Greenlee Knockout Punches and Cutters make it easy to enlarge holes in switch boxes, cabinets, etc. They form clean-cut holes quickly and accurately, without any reaming or filing.

Other Tools

Hydraulic Pipe Pushers
Joist Borens Bit Extensions
Electrician Bits

Let Us Send Complete Information

GREENLEE TOOL CO.
ROCKFORD ILLINOIS

GREENLEE TOOL CO.
ROCKFORD, ILLINOIS

Please send complete information on the following:
☐ Conduit Benders
☐ Knockout Tools

Name
Street
City
State
My jobber is.....

• • • Combines the assurance of a permanent electrical installation with ease of installing - a combination only the highest grade of standard weight rigid steel conduit can give you.

Adaptable to every type of building construction and occupancy.

THE YOUNGSTOWN SHEET AND TUBE COMPANY
 Youngstown, Ohio

BLACK ENAMELED • ELECTRO or HOT DIPPED GALVANIZED

These Products Make Jobs Easier

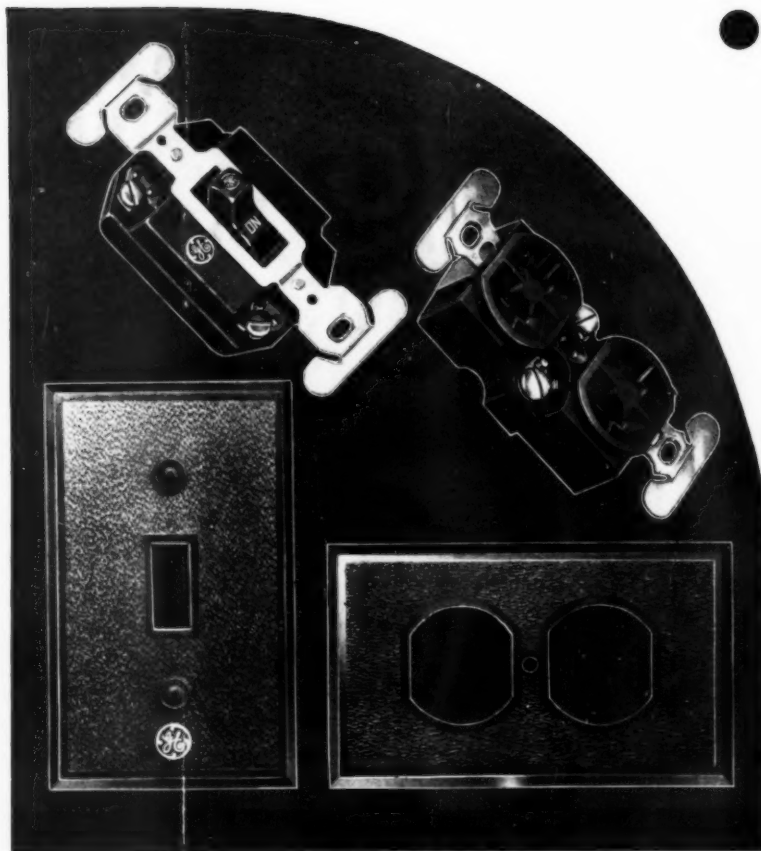
General Electric Tapes are designed to make jobs easier and to give maximum service and protection. G-E Friction Tape does not dry up and curl . . . it really sticks. G-E Rubber Tape can be moulded by the heat of the hand into a solid mass, forming a watertight joint. G-E Tapes cost no more than ordinary tapes. It pays to use them.

General Electric Soldering Fluxes are convenient, efficient and economical. No second "dips" are required. G-E Core Solder saves time and money. Use it for soldering anything except aluminum.

For further information on Tapes or Solders see your nearest G-E Merchandise Distributor. Or write Section MD-208, Merchandise Department, General Electric Company, Bridgeport, Connecticut.



MISCELLANEOUS PRODUCTS



For A Neat Quick Job Use General Electric

SWITCHES AND OUTLETS (WITH WIDE MOUNTING EARS)

General Electric Switches and Convenience Outlets have wide mounting ears. Use them to save time and to assure correct alignment of the device with the wall surface, without the use of washers. The ears lie flat with the wall automatically leveling the device. On work where wide ears are not needed, a twist of the pliers removes the wide ear and the standard ear remains.

G-E Switches and Outlets are rugged, dependable, will give long service. There is a complete line, a device for every purpose. For a finished job use G-E Textolite plates with G-E Switches and Convenience Outlets.

Your G-E Merchandise Distributor can supply you. For further information see him or write Section MD-208, Merchandise Department, General Electric Company, Bridgeport, Connecticut.



WIRING DEVICES

GENERAL ELECTRIC

MERCHANDISE DEPARTMENT, GENERAL ELECTRIC COMPANY, BRIDGEPORT, CONNECTICUT

